This magazine is published to promote sound thought upon and concerning industrial medicine and traumatic surgery. To that end it will contain articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited.

Industrial Medicine

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A Plan for Medical Care

—(This article is submitted as the result of requests for a more detailed description of a "Plan for Medical Care" presented in this Journal in June, 1944)—*

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A PLAN for medical care, somewhat different from any proposed before, is submitted for three reasons:

First, socialized medicine, as represented by any current proposal, fails to fulfill its aims when judged on the basis of economic feasibility, public interests served, and in consideration of the probability of mishandling under bureaucratic operation.

The above statement is predicated on objective studies made by A. T. COURT, of the Labor Economics Department of the General Motors Corporation. These studies reveal a direct relation between income and health. They also reveal that below a certain average income no amount of money spent on the isolated factor of medical care improves health. Further, they reveal that beyond the optimum ratio of income to health, increasing the *cost* of this isolated factor will not improve health either.

Projecting these conclusions, we may assume:

1. That adequate medical care and health are not synonymous.

2. That health depends on housing, food, clothing, emotions and many other factors.

3. Because of a failure to recognize this fact, present plans for "socialized medicine" must, of necessity, be confused, i. e., all plans for *socialized medicine* are striving for *general health improvement* without recognizing the fact that, in health, medical care is but one factor of many. This confusion is dangerous. The medical profession should recognize that this aim is predicated on a false assumption.

Secondly, it is felt that the status quo of medical practice cannot be maintained. This is so because of changing economic conditions over which the medical profession has no control.

As society becomes more complex there are increasing numbers of factors which must be taken into consideration in the posing and solving of any problem bearing on human relations. This force brings about specialization in all fields. It indicates, too, that the medical profession alone cannot properly solve the problems of national health maintenance.

There should be no doubt in the minds of members of the medical profession that national health maintenance is going to be a real issue.

Thirdly, there is a way whereby the medical profession may maintain its proper position. This particular plan may not be the answer, but there is an answer somewhere in this direction.

A Plan for the Extension of Medical Care

A PLAN for medical care must embody consideration of:

(a) Historically significant facts to be sound.
(b) Politically significant facts to be current.
(c) Public interest to be worthwhile.
(d) Economic feasibility to be lasting.
(e) The position of the medical profession to maintain high standards of medical practice.

Such a plan must also guarantee:

(a) That the medical profession is willing and, with proper aid, able to assume its part of the leadership in public health maintenance.

(b) Freedom of choice of physicians on the part of the patient.

(c) Freedom of choice of patient on the part of the doctor.

(d) To treat the well person to keep him well as explicitly as the sick person to cure him.

(e) To provide security for the patient in the problems of medical care and hospitalization on a prepayment basis.

(f) To provide economic security for the doctor through his effort and not as a reimbursement for giving up his individuality.

(g) To provide for adequate facilities for hospitalization and medical care.

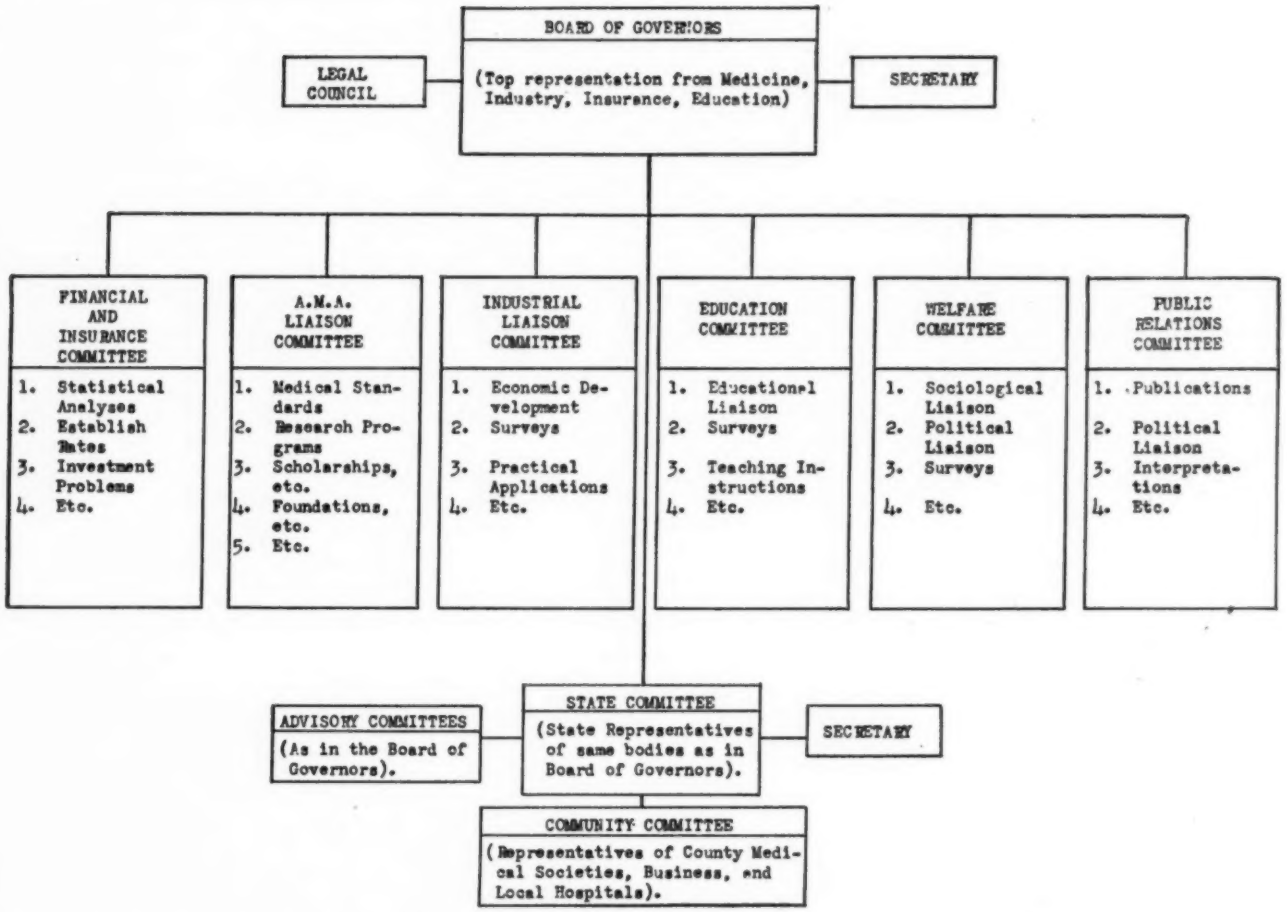
(h) To provide for proper financing of teaching and research institutions that they may not be unduly affected by economic changes.

(i) That public relations, legal, insurance and public welfare problems will be handled with great acumen.

The first step is to find a desirable partner for this program as an alternative to a partnership with a Federal or state political jurisdiction.

The second step is to consider the plan as a community backed by state and national bodies. (The

*See *Industrial Medicine*, 13:6, 58, (June) 1944.

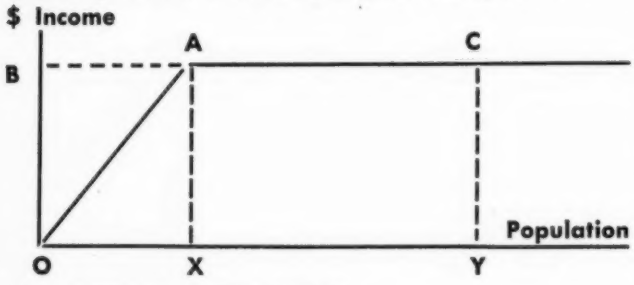


accompanying organization chart is a suggestion for this procedure.)

If a plan is to embody and guarantee the things mentioned above, it must be national in scope, but its application must be on a community basis. The local problems of New York City and those of a rural community in the Southwest vary considerably.

Politically, and industrially, problems are divisible in the same manner. The present functional operation of the medical profession is based on local societies, state associations, and the American Medical Association, so it is already in line. This is not coincidence.

It is proposed that industry is the logical place for medicine to look for cooperation in the development of a medical plan. Industry is not a factory. It is any circumstance where effort or work results in the production of goods or services for which pay is received. With this definition it is easy to see how community planning would have every chance for success.



A. HISTORICAL JUSTIFICATION:

The above graph represents a simplification of COURT'S statistical survey and may be interpreted as follows:

1. The ordinate represents family income. The abscissa is population.

2. The line "O-A-C" represents the family level of health.

3. Line "A-O" represents a decreasing health status with decreasing income. (Thirty years' experience in England under a panel system of medicine shows that giving free medical care to this group does not result in health improvement.)

4. Line "A-C" does not rise with increased income or increased expenditures for any single component of health after income reaches "B."

5. Point "A" must represent the optimum cost for medical care, housing, feeding, clothing, recreation and the other things which, taken together, favor optimum health maintenance. This must be so, for at that point "O-A-C" levels off, i.e., if we can determine what the average family of "B," or optimum income, spends on these components, we have a scientific method for establishing a cost base for a general health program and can ascertain the expected or optimum cost of each component factor.

6. Area "A-C-Y-X" represents a group of people (at this time a majority) who are gainfully employed and have an income adequate to optimum health maintenance. This group would give little trouble in any plan for medical care or health maintenance. This is the group normally cared for by private practice.

7. Area "B-A-X-O" represents a group (a minority at this time, but increasing with unemployment) which is a real problem. This is the group in which government is interested and yet evidence shows (a) that spending large sums on medical care does not improve health, and (b) that present methods used by the government in an effort to raise the line from "O-A" to "B-A" have been exceedingly costly without accomplishing the result intended.

8. As area "B-A-X-O" increases with unemployment

it encroaches upon area "A-C-Y-X." If government interest follows the extension of "B-A-X-O" there will be great confusion between the administration of the two areas if they continue to be separately administered. Socialized medicine advocates government control over the whole area "B-A-X-O." Dividing responsibility for areas "B-A-X-O" and "A-C-Y-X" is the status quo. This proposal is based on having the "plan" take responsibility for all of area "B-C-Y-O."

THAT INDUSTRY and the medical profession should combine forces to administer the health problems of the nation is predicated on the following:

1. That industry, as defined, is the primary source of all income.

2. That adequate income is essential to health maintenance.

3. That taxation of industry and employed persons is the source of government money to operate any proposed health plan.

4. That industry, by maintaining an optimum income for all persons, will benefit financially to the extent of the cost differential between government and industry operation of health maintenance.

5. That payroll deductions from employed persons plus contributions from industry would be the financial basis of this plan. These would unquestionably be lower under industry operation than otherwise.

6. That income maintenance could be administered by present insurance organizations using these funds.

7. That, with income maintenance, progress in preventive medicine and chemotherapy, the problem of cost would become progressively easier during the ensuing years. This because the group in area "B-A-X-O" which is at present unemployed or unemployable because of impaired health or mentality would tend to diminish. The greater the number of persons in area "A-C-Y-X" the less the cost. Evidence developed by industry during this war period shows that funds spent on industrial health maintenance are self-liquidating through increased efficiency, lowered absenteeism, labor turnover and unrest on the part of employees.

The assumption that industry would be interested in such a plan must remain such until further discussion is had. Nothing to date would suggest a lack of interest on the part of industry.

B. POLITICAL SIGNIFICANCE:

If our system of government is to remain on its basis of free enterprise this program would guarantee individuality and personal integrity beyond any suggested government medical plan. Each person would pay his share of the cost of health maintenance.

C. PUBLIC INTERESTS:

Under this plan every person could voluntarily elect to free himself and his family from worry over costs of medical and hospital care. They would go to the doctor of their own choosing, if it were possible to see him, or could be referred to a reputable other choice. There would be no limitation on length or cost of care. There would be no waiting period before benefits were available. Having paid for this, there would not be a feeling of paternalism.

Cost of medical care and hospitalization would be based on critical analysis of point "A" in the graph. This would give a perspective, now lacking, by which to evaluate results. It would simplify the problem of allocation of funds for the maintenance of the other components of health. This is necessary to any income maintenance plan. Such a plan must have proper actuarial methods as a basis.

Public interest would be served by dealing through the community as a base, because the analysis of any individual problem is more likely to be accurate if it is handled in the locality where the individual is known. Any comparable effort based on government jurisdiction would suffer by comparison for reasons so obvious as not to need recounting.

D. THE ECONOMIC FEASIBILITY OF THIS PLAN IS SUGGESTED BECAUSE:

1. It offers an actual basis for calculation of costs.

2. It segregates the costs of medical and hospital care from the confusing complexity of cost of over-all health maintenance.

3. It requires the patient to contribute but for this gives him complete care at reduced cost by community grouping of risk.

4. It requires a contribution from industry, but immediately returns this in increased efficiency, and eventually in reduced taxation.

5. It provides for administration through aid from insurance organizations whose experience guarantees proper statistical analysis in organization and procedure.

6. It utilizes already existing agencies of the medical profession, industry, insurance and the community. It changes little except for a coordinating and shifting of responsibilities.

7. The results can be accurately measured.

8. There will be no necessity for the maintenance of a cumbersome bureaucracy built up for this purpose.

9. The cost to industry of developing an income maintenance plan is so obviously self-liquidating under this program as to need little argument.

10. If a plan on this basis is not developed by industry-medical-insurance coordination it will be done for them, there is no doubt. There also is no doubt that, no matter what the cost of this program, any developed by government will be still more costly. Further, under a socialized system all the many intangible benefits which would accrue under such a proposal as this one would be lost. It is possible the loss of such an opportunity would make further disintegration of private enterprise inevitable.

WITH these assumptions in mind a plan may be organized as follows (reference to the organization chart will aid in visualizing the structure):

1. The national headquarters or board of governors would be:

(a) Advisory in capacity, taking into consideration the formulation of policy based on information from the special committees as given on the chart.

(b) Composed of the outstanding representatives of the American Medical Association, industry, education and insurance.

(c) Charged with the responsibility of surveying the country and establishing standards according to conditions.

(d) Responsible for the methods by which funds would be handled.

(e) Responsible for maintenance of medical standards, proper allocation of funds for research, etc.

(f) The clearing house through which medical, industrial and educational foundations, etc., would exchange information and requests for information on health problems and research.

(g) Responsible for the proper balance of the program by analyzing economic political, public relations, legal and other problems exerting an influence on its operation.

(h) The official representative of the plan to government.

(i) The governing body of all state councils.

(j) Responsible for an effort to unify state laws affecting operations.

(It has been suggested that there is no labor representation on the Board of Governors. The reason for this is obvious. This is a program for the administration of medical care and is not a political organization, therefore real or fancied differences between "capital" and "labor" are not justified of representation. Neither is "capital" represented on the Board of Governors and for the same reason. Industry representation alone combines the advice of management and labor. Since a broken leg is broken no matter what the status of its owner, it is not desirable to confuse issues.)

2. The State Council would be similar in organization, but would have great responsibility in the operation of the community groups based on policies established by the National Board of Governors, but amended to work in harmony with varying state laws. The medical representation would be elected from the State Medical Association.

3. The community committee would be composed of representatives of the County Medical Society, local industry and hospital administrators. Their responsibility would be the detailed operation and administration of the plan in their communities.

ACTUALLY to get such a plan into operation would require an enormous amount of detailed study. Going into such detail here would be inadvisable. A brief outline of a method, however, is in order.

1. Each employed person would make a weekly or monthly cash payment to insure himself and his family complete medical and hospital care.

2. Employers or industry would contribute a sum less than or equal to that paid by the employee.

3. For the unemployed or unemployable, the local community would make the contribution from funds now used for indigent or county care.

4. All money collected would be forwarded to the State Committee which will make all reimbursements.

5. The State Committee would allocate a portion of money collected for needs of the National Board.

6. The amount collected would be established through proper study, and would diminish when adequate contingent reserves were built up.

7. The National Board would decide the propriety of investing these reserves, and (8) would establish a method for computing units which would be the basis of payment to physicians. These would vary with training and ability as well as with community requirements. Past performance could be used as one yardstick.

9. A flat monthly fee in the nature of a retainer would be paid all participating physicians. For this fee a predetermined number of units of work would be expected.

10. To increase his income the physician would undertake the doing of additional units of work. There should be no arbitrary top limit.

11. Hospital requirements would be met by paying a stated sum to participating hospitals per bed day for the performance of hospital care.

Summary and Conclusions

UNLESS the medical profession is willing to assume the responsibility for cooperating in the development and administration of a program of health maintenance of its own accord, it will be obliged to do so under circumstances unfavorable to the profession and uneconomical for the country.

A suggestion for evolving such a plan is offered.

Benign Pulmonary Changes in Arc-Welders

—"Arc-Welder's Siderosis"—

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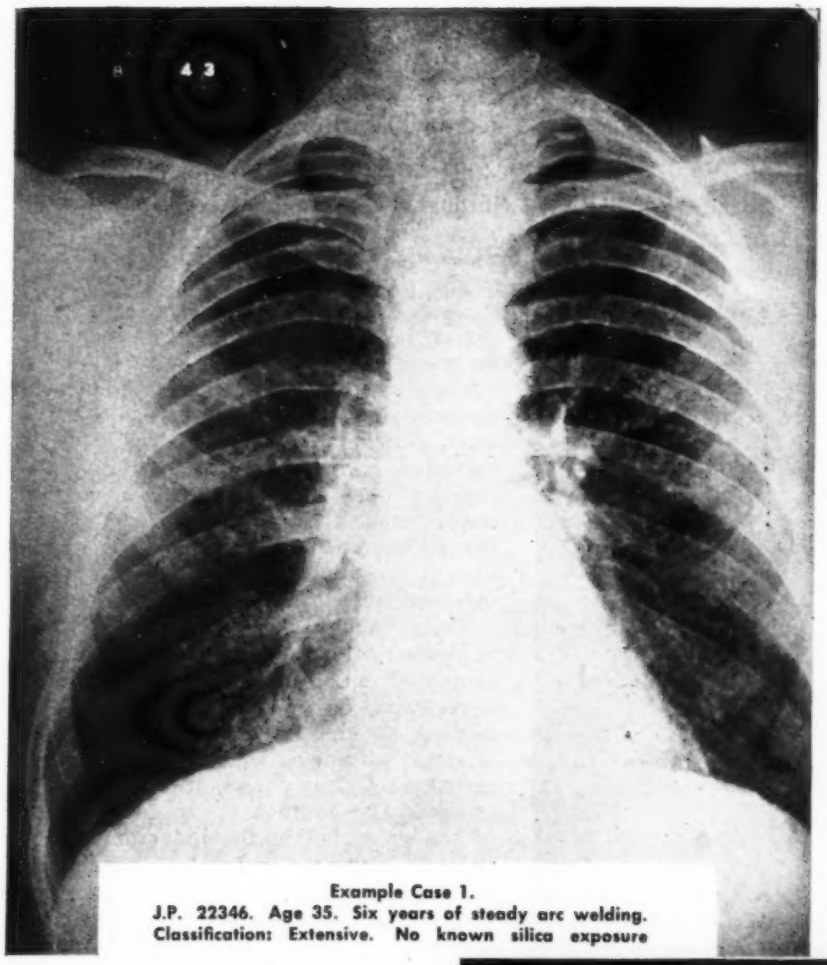
PULMONARY changes as demonstrated on x-ray films of the chests of some arc-welders have been observed since 1936 by various authors. First described by Doig and McLaughlin[1] in England, Enzer and Sander[2] of Milwaukee had the opportunity to follow some of these cases over a period of years and autopsied one case. It was stated that these changes would occur only if the welding operation was done in confined places, poorly aerated, such as the insides of tanks. Reports were few and not always confirmative.

Several arc-welders found unfit for military duty at the Army Induction Station in Cleveland, Ohio, on the basis of certain pulmonary changes observed on their chest films, called my attention to the possibility of a common lesion in their lungs. A connection to arc-welding was discounted by the plant authorities where all of these men were employed. This industrial plant employed about 125 arc-welders, almost all in the younger age groups, below the age of 40 years. These men had spent most of their working years in welding, and many had been taught welding in the welding school maintained by this firm. The welding operations were on truck and jeep frames and gun mountings in jigs of two or more men in a large factory building, about 900 feet long, 100 or more feet wide, and about 40 feet high. A simple canvas curtain separated these operations about 15 feet apart, protecting each jig from exposure to ultra-violet radiations. Overhanging each operation was a large cone-shaped hood with a suction fan in the tip of the cone. In so disposing of the welding fumes, they were brought past the breathing zone of the welder. It had been assumed that this protection was adequate. Out of the 125 welders, 83 men of the younger group presented themselves for x-ray studies of their chests. Complete histories were taken as to previous exposure to silica dusts. Any cases with positive histories were excluded. Seventy-one per cent of 83 chests showed a peculiar fine nodulation evenly distributed over the lung fields. In some of the cases it seemed to be more granular and denser, individual lesions sharply defined, overlapping in the thicker central lung fields about the hilus regions. These lesions measured from 1 to 3 mm. in diameter and were roughly rounded. Linear markings in the vicinity of the hili were found to be exaggerated in a few cases, but not any more frequently than seen in a group of normal chests. The hilus regions were not enlarged nor prominent, and no large nodes could be identified along the mediastinum.

One is impressed by the absence of fibrosis, pericardial or diaphragmatic adhesions, and thickened septa. There were no inflammatory changes whatsoever and no thickened pleura. These lungs were perfectly normal except for one thing—the nodulations. Therein lies the difference between the arc-welder's lung and a simple, uncomplicated silicosis, which is its closest imitator. Tuberculosis of a miliary type can be ruled out only on the clinical history, as the patient would be ill, almost toxic, and the arc-welders have no complaints whatsoever in reference to an acute illness. The differentiation on the x-ray film alone would be difficult.

Presented at the Annual Meeting of the Ohio State Radiological Society in conjunction with the 98th Annual Meeting of the Ohio State Medical Association, May 2-4, 1944, Columbus; published concurrently in *Ohio State Med. J.*, August, 1944.



Example Case 1.
J.P. 22346. Age 35. Six years of steady arc welding. Classification: Extensive. No known silica exposure

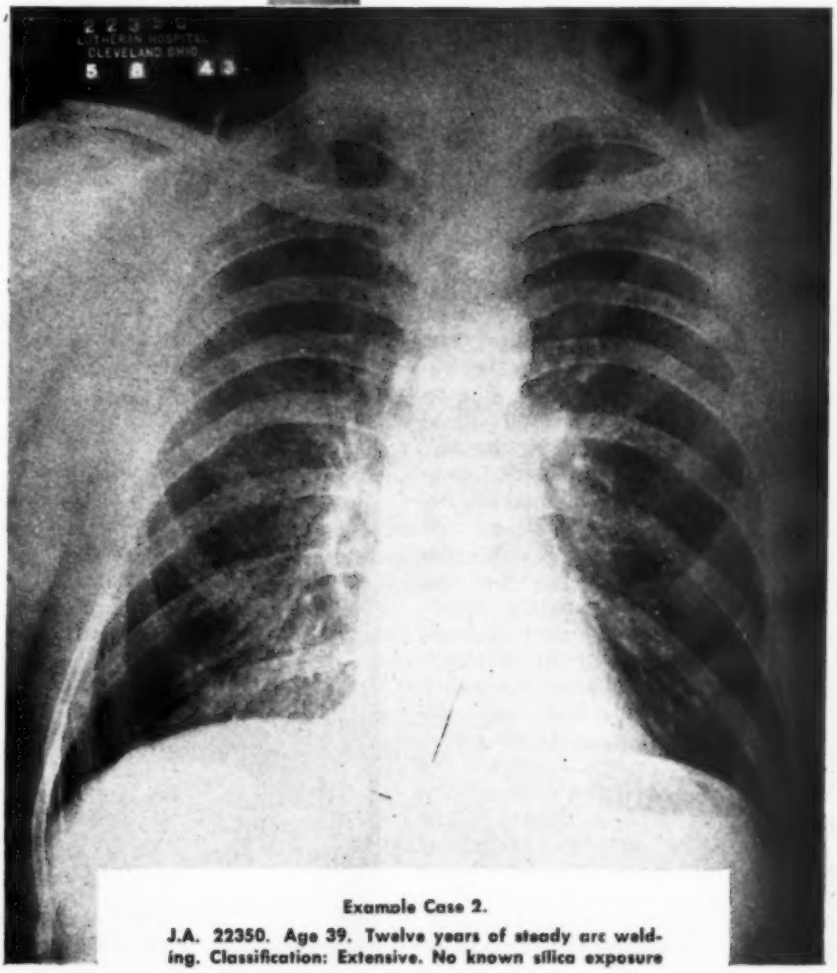
We classified positive cases in two groups—a minimal and an extensive group. This was based primarily on the extent of involvement of the lungs. The minimal group showed a softer mottling about the central lung fields, and the extensive group included a more wide-spread, denser mottling including apex and bases. None but distinctly mottled lungs were classified as positive cases, and all lungs with increased linear markings only were grouped with the normal, although some of these cases were thought by others to be early positive cases. This simple classification placed 33 cases of the 59 positive into the extensive group.

According to these findings we have a higher incidence than ever before observed in any group study. Still, the welding operations were not carried out in closely confined places, such as inside tanks or poorly aerated small rooms, which was formerly held to be the sole explanation. This proves that the necessity for adequate ventilation exists in other than the small confined space. Six non-welders working along with the welders, such as cleaners, helpers, electricians or crane operators showed normal lungs, indicating that in lower concentrations of the fumes, iron oxide is not deposited.

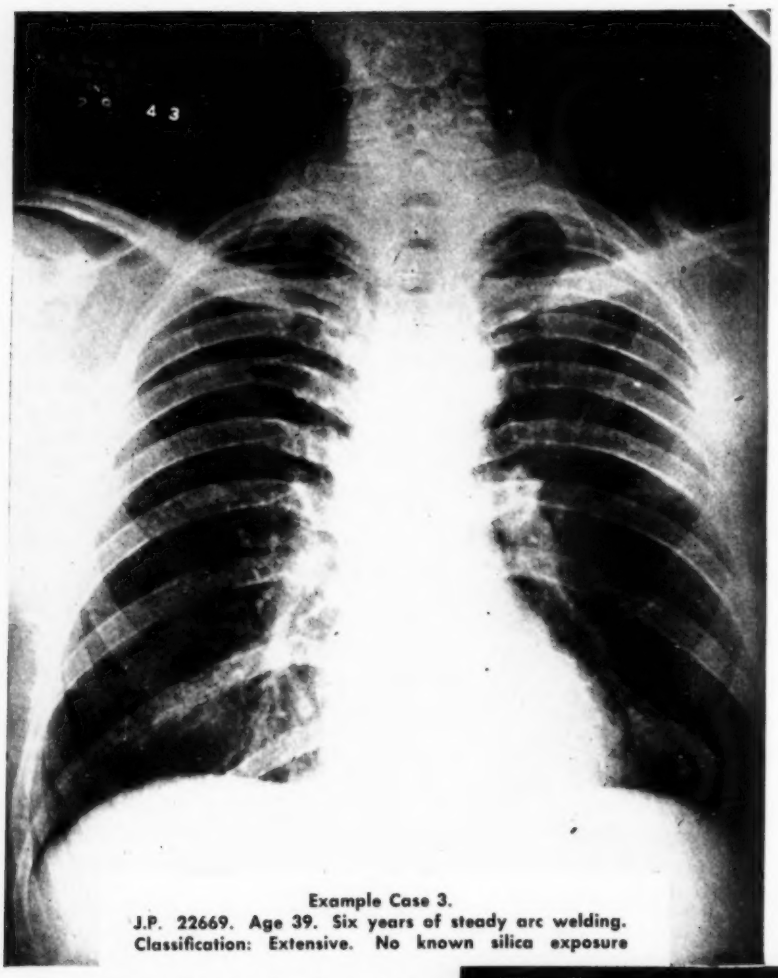
In this study we were impressed by the complete absence of active pulmonary tuberculosis. There were five men who showed fibrotic or calcified, adult type lesions, all of whom had been welding between five and 10 years steadily. None showed any reactivation of the old lesions. This finding has been uniformly reported by previous authors, one of whom actually described the healing of an active ulcerative tuberculous lesion in a lung which was the seat of extensive iron-oxide staining, in spite of the fact that the patient had never ceased welding. (Presented in the November meeting of the Industrial Hygiene Foundation, 1943.[4])

Hence all the evidence available thus far indicates that the condition of arc-welder's lung does not predispose to pulmonary tuberculosis or reactivate an old arrested tuberculosis of the lungs.

The pathological picture as described by Enzer and Sander in 1938[2] based on an autopsy finding in one of their 10 cases, shows conclusively that iron oxide is the invader, deposited along the pulmonary vessels into lymphatic channels and also into the regional lymph nodes. This must be recognized as the opaque substance which on the x-ray plate manifests itself as a fine, discrete mottling or



Example Case 2.
J.A. 22350. Age 39. Twelve years of steady arc welding. Classification: Extensive. No known silica exposure

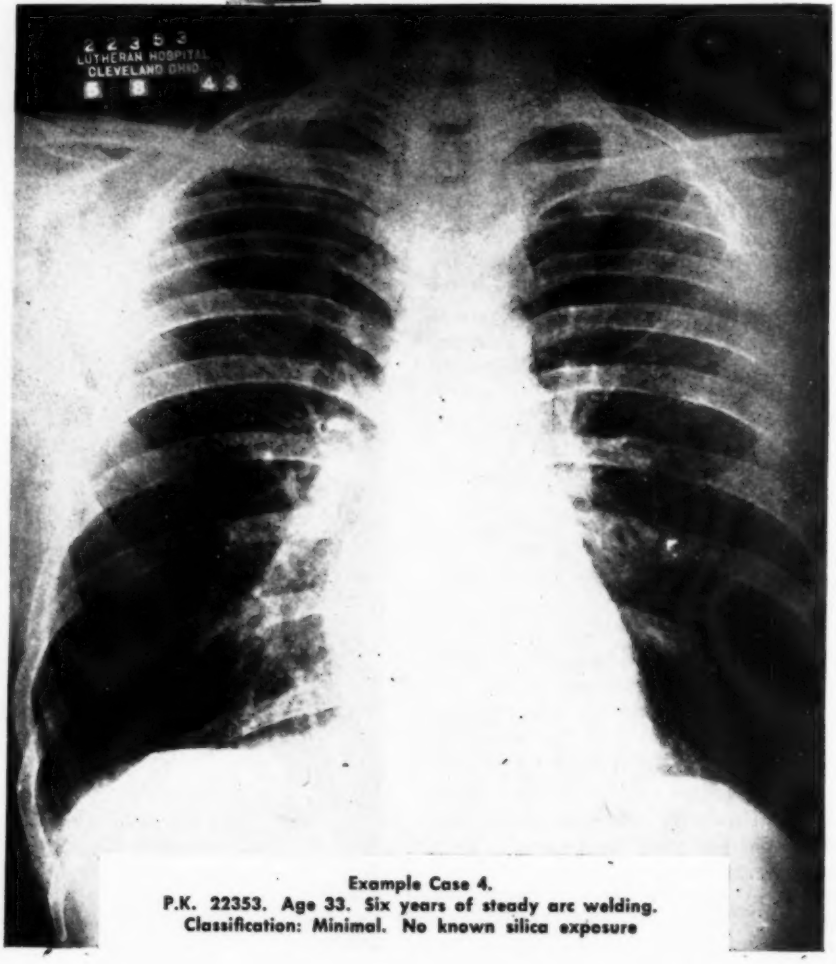


Example Case 3.
J.P. 22669. Age 39. Six years of steady arc welding.
Classification: Extensive. No known silica exposure

nodulation varying in size from 1 to 4 mm. in diameter. "A fine, black pigment was found widely distributed in both lungs with a complete absence of any scarring or fibrous nodulations." "There is an entire absence of fibrosis. Inflammatory response to this foreign material is likewise lacking. Giant cells do not occur. Connective tissue stains disclose that lymph nodes are free of fibrous tissue." "In particular, emphasis should be placed on the absence of phagocytes and fibrous tissue around bronchi and blood vessels at the root of the lungs."

In a few cases we noted a conspicuous absence of correlation between the pulmonary findings and the duration of welding: an observation which Sander described as "disturbing and apparently inconsistent." One of our negative cases had been welding without interruption for 16 years, whereas several of our extensive cases had been employed as welders for only six years. These are exceptions, however. We believe that the importance of the time element is best shown in the averages. The average period of welding for those with normal lungs was 6.7 years, for those with slight nodulation 8.5 years, and for those with more extensive changes 9.2 years. Our experience does not allow us yet to confirm or deny the conclusion given by Enzer and Sander that conditions of exceptionally poor ventilation, such as inside tank welding operations, explain the positive cases. All of our welders apparently worked under similar conditions throughout. An exhaustive study of the atmospheric conditions at the various stations of operation was not done. These might have demonstrated actual differences in exposure which would explain the variation in the development of signs. If we are forced to look elsewhere for an explanation of the occasional case of conspicuous disparity, it seems to us that the most plausible explanation would be a variation in individual susceptibility, depending upon such factors as tendency toward mouth breathing and defects in the physiological mechanism of dust filtration in the upper air passages. Both factors may play a part.

Even though the presence of arc-welder's nodulation apparently causes no disability in the physiological sense, it is nevertheless a rather serious potential menace to the mental stability of the affected workmen, when its presence is revealed by x-ray examination. The evaluation of the findings is not the function of the physician in the induction center. In most cases he does not even have the advantage of an occupational history to help him in diagnosis, and in any case it is



Example Case 4.
P.K. 22353. Age 33. Six years of steady arc welding.
Classification: Minimal. No known silica exposure

not his function to give advice. He refers the man back to his physician for observation. It is for this reason that the general practitioner must know and recognize the arc-welder's lung in order that he may advise his patient intelligently.

What should be the attitude of the physician who is confronted by this condition? How should he interpret the situation to his patient? These are questions which we cannot answer at the present time with a complete air of finality. Neither, however, can we ignore them until all the final pathological and clinical results on this subject have been presented and evaluated. We must, therefore, answer these questions in the light of the evidence presented to date, and base our advice on assumptions which seem logical in the light of present knowledge.

Our advice to the arc-welder with these positive x-ray findings is that it is entirely unjustified for him to change his occupation and sacrifice his years of valuable experience in welding. We advise him that there is no evidence which suggests any disability from this exposure nor any evidence which suggests any possible future disability from the condition.

We furthermore attempt to impress him with the idea that an x-ray plate taken in the future, either in a mass survey, in a selective service examination, or a pre-employment examination, may be so interpreted as to cause unjustified apprehension over his physical condition. This warning may prove extremely valuable in protecting him against a state of panic if the x-ray findings are interpreted as something other than arc-welder's siderosis by his future medical examiners. With this advice in mind he may reasonably request further consultation and refer back to his original examination and occupational history to establish the identity of his lung mottling.

In viewing this condition as benign, we believe we are completely justified. If this assumption is not borne out by future research, and the condition does prove to have serious aspects, experience has shown us that news of pathological seriousness, like other bad news, travels fast. Serious results, if any ever do develop from this condition, would find a spectacular place in current medical literature. We repeat that we can see no reason at this time to anticipate any cause for present alarm from this arc-welder's siderosis.

We can see much danger in attaching an unjustifiably serious prognosis to the condition at this time, because once an alarmist outlook has gained an entrance into medical literature, it will be perpetuated ad infinitum, to the medical and occupational detriment of the affected employee.

We wish in no way to imply that the accumulation of these shadows in a chest by any individual should be encouraged. On the contrary, we believe that proper exhaust ventilation should be immediately established wherever the exposure may be severe enough to cause siderosis. We feel this whole subject offers a challenge for further exploration to the clinician, the roentgenologist, and the pathologist, to establish the complete and thorough picture of its etiology and its effects.

We do not believe, however, that industrial hygienists and those in charge of plant operations should wait for these final conclusions. Theirs, we believe, is the greater challenge, to prevent its occurrence as completely and as early as possible, and by the prevention of severe exposures convert the final clinical conclusion into a matter of academic interest rather than allowing it to remain a subject of clinical and medical importance.

Summary

ARC-WELDER'S siderosis is a well established condition.

2. The rejection of several arc-welders by the army in Cleveland led to the x-raying of 83 of their fellow-workers of whom 59 displayed positive findings.

3. It is not necessary that the poorly aerated space in which the welder is exposed to high concentrations of welding fumes be small.

4. Some of the most extensive cases observed in this group of welders had been welding only about six years, but no siderosis was found in cases welding less than six years.

5. Arc-welder's siderosis has not predisposed to tuberculosis or reactivated old calcified lesions in the lungs in this group of welders.

6. Prevention of arc-welder's siderosis can only be successful by necessary ventilation, no matter how large the working space, to protect the welder from inhalation of highly concentrated welding fumes.

7. All evidence to date indicates that arc-welder's siderosis is not a hazard to the health of a workman, but a serious potential menace to the mental stability of the welder if not soundly evaluated by the physician and intelligently interpreted to the affected welder and to the prospective employer.

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The Treatment of Trinitrotoluene Poisoning

KARL R. LUTHY, M.D.

POISONING is to be expected when a group of workers is exposed to any toxic substance, as in the manufacture of trinitrotoluene. The more intimate the exposure, the earlier the symptoms of poisoning manifest themselves. Trinitrotoluene is the result of intense nitration of toluene, either of which substances is poisonous. The intimate contact of the worker with these chemicals provides numerous and prolific chances of absorption, thence toxic reactions. The problems arising in this work are many and varied. Previously, if the employee could be detected in time and removed from contact with trinitrotoluene before serious symptoms developed in the liver, the patient usually recovered. A number of these workers could return to their old occupations and successfully continue in the work. When the toxemia has advanced to such a point that the patient voluntarily comes to the hospital for treatment, is is usually necessary to transfer the majority of these men permanently. Only time will tell whether the same individuals will make a complete recovery or will return in the future with atrophic livers or damage to other internal organs.

Daily change to freshly laundered uniforms, daily showers at the close of shift, the administration of vitamins, the efforts on the part of the company to reduce the dust hazard all have added to the reduction of trinitrotoluene absorption; but in spite of these precautions the toxic exposure cannot be eliminated entirely and patients continue to come to the hospital complaining of headache, dizziness, somnolence, poor appetite, constipation, nausea and at times vomiting, with tenderness along the costal border. The large amount of research that has been done in the past has not developed a treatment that will keep the man on the job and, at times, transfers from this exposure

were so numerous in this as in other plants that, coming with other causes for absenteeism, they threatened the operation of some of the lines making the explosive.

Dr. John H. Foulger, of the Haskell Laboratory of Industrial Toxicology, Wilmington, Delaware, has done extensive research on blood pressure, and one of the many things he discovered was the variation of blood pressure between the two arms. He formulated a chart of normal values, using the average of the blood pressure readings of the two arms to estimate the normal range. Persons who had absorbed toxic chemicals, those suffering from disease or from extreme fatigue, were apt to show a blood pressure reaction which did not conform to the normal classification on this chart and were said to be "off score."

Knowing that the "off score" conditions could be caused by chemical absorption of trinitrotoluene and that the same chemical produced an irritation of the liver, I decided to find out (1) whether the absorption of chemicals was sufficient to cause an "off score" reaction, (2) what relation the "off score" reaction had to the icterus index, and (3) how many "off score" workers also would show an increase in the icterus index. I began the work of determining the answers to these questions with the men found to be "off score" in our periodic re-checks of all our workers exposed to trinitrotoluene. These periodic examinations consisted in recording the blood pressure (the readings of each arm taken for comparison), temperature, pulse and hemoglobin estimation.

During the two months previous to the beginning of treatment 752 periodic examinations were made. Sixty-three, or 8.4%, of the persons examined were "off score." Sixteen, or 25%, of these "off score" workers developed symptoms of such severity that it was necessary to remove them from contact with trinitrotoluene, making seven of the 16 transfers permanent. In these periodic re-checks 1,143 men were examined from November 1, 1943, to January 21, 1944. Of these, 207, or 18%, were found to be "off score." I believe that the difference in the number of "off score" reactions in the two months previous to the beginning of treatment September and October, and the higher incidence in the three following months are probably due to the fact that the buildings were closed during the winter season, thus giving a greater chance of trinitrotoluene absorption.

Of these 207 "off score" persons 97 were selected at random and examined in our laboratory. These men were taken through a routine of red blood cell count, hemoglobin estimation, white blood cell count, urinalysis (chemical and microscopic), pigmentation test and icterus index. With the present knowledge of trinitrotoluene the pigmentation test and the Webster test are indicative only of the trinitrotoluene being absorbed and excreted. The finding of pigment in the urine is evidence of the chemical being metabolized. The absence of a positive reaction in the Webster test does not mean that the worker is not absorbing the trinitrotoluene necessarily, but it can mean that the worker, if exposed to the trinitrotoluene, is retaining this poison and becoming rapidly more toxic. The coagulation time of the blood was tested on a considerable number at the beginning of the research, but this procedure was dropped when the first 20 men showed a normal coagulation time. The fragility test was tried likewise and discarded for the same reason. The sedimentation test was tried more extensively than the preceding two. The only time it reacted abnormally was when there were other factors present which seemed to have more influence with the sedimentation of the blood than the trinitrotoluene did. The majority of men who had a positive icterus index gave a normal sedimentation time, and as a result the sedimentation test was discontinued as of no value in this study. The icterus index was the only laboratory procedure which seemed to give consistent results that could be depended on in the detection of trinitrotoluene poisoning in its early stages.

Forty-four, or 45.3%, of the 98 "off score" workers selected for the more exhaustive laboratory tests were found to have an icterus index of 8 or above, leaving 53, or 55.6%, with no rise of icterus index, thus conclusively demonstrating that the "off score" reactions in their cases were due to some other cause than trinitrotoluene absorption. Most of the men who showed a rise in their icterus index, when subjected to the routine laboratory procedure, showed not any or only very mild symptoms of trinitrotoluene absorption through any other means than the laboratory routine for finding the amount of the chemical absorbed. This showed that the laboratory technic was able to catch the poisoning in its earliest stages before any external signs appeared. There was no jaundice and no bile in the urine.

All men with an icterus index of 8 or above were not transferred from the trinitrotoluene lines but were placed on a routine high carbohydrate treatment: The patient was advised to eat large amounts of bread, potatoes, cereals with sugar, pastries, fruits with sugar and large quantities of sugar in his coffee and tea. In addition he was to consume at least 10 to 12 sticks of candy daily and drink freely of water. Vitamins were added to the daily intake consisting of vitamin A 5,000 U.S.P. units, vitamin D 500 U.S.P. units, vitamin C 100 mg., vitamin B 500 international units, vitamin B_2 1,000 micrograms, vitamin B_6 200 micrograms and nicotinic acid amide 20 mg. Three capsules were taken daily. Dicalcium phosphate 7½ grain (0.5 gram) wafers, also was taken in the amount of two wafers, or 15 grains (1 gm.) daily to protect the red blood cells. This treatment was continued for 10 days, then the same routine laboratory re-check was made. Of the 44 under treatment all but two were found to have a decrease in the icterus index and other symptoms. These two men had a slight increase in the icterus index. They were continued a second 10 days on the same treatment and again re-checked. The re-checking and treatment were continued in 10-day intervals until the icterus index reached normal and other symptoms of the trinitrotoluene absorption had disappeared. The patient was then dismissed with the advice that he continue on his high carbohydrate diet, decreased about one-fourth. Of all patients treated the icterus index returned to normal and has remained normal for a period of several months under the same working conditions which caused the first period of trinitrotoluene absorption.

Summary

FORTY-FOUR patients treated for trinitrotoluene absorption as indicated by the icterus index have all returned to normal.

2. It was not necessary to transfer any worker from his employment before, during, or after treatment.

3. Only two patients had a rise in the icterus index after treatment was begun, and both returned to normal after a second 10-day treatment period.

4. The icterus index is the most reliable agent and is of the greatest value in the detection of trinitrotoluene absorption in its early stages.

5. These cases should be found and treated in the early stages before any serious complications have developed.

6. The icterus index detects liver damage in the early catarrhal stage, before permanent harm is done.

7. In the majority of cases the liver will metabolize trinitrotoluene if heavily fortified with glycogen.

8. At no time during the heavy carbohydrate feeding of these patients was glycosuria detected.

9. Approximately 5% of the workers in trinitrotoluene with an "off score" reaction from chemical absorption will show an increase in the icterus index.

10. No employee with an increased icterus index, from any cause whatever, should be allowed to work in trinitrotoluene unless he is fortified with glycogen.

11. Thorough bathing at the end of each shift with an especially prepared soap which has an indicator incorporated so the worker may know when the trinitrotoluene is removed, lessens the toxic absorption.

12. Trinitrotoluene absorption is increased in winter months, owing to the closure of buildings and thus to the increase of dust in the air.

Fellowship in Industrial Medicine

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THE development of industrial medicine in recent years has changed an ill-defined field of medical practice into one requiring a definite body of knowledge and of functional skills. Not very long ago the industrial practitioner was largely limited to the care of surgical emergencies and to a superimposed general practice whenever plant employees sought his advice for ordinary illness. The growth of the concept of preventive medicine with its extensive studies of toxic hazards in industry and the development of a wider concept as to the limits of industrial medicine made ever increasing demands upon the physician in industry. These demands have in many instances been made haphazardly. The lack of adequate medical programs, the lack of facilities in many industries to carry out adequate programs even when such programs found existence within the minds of the physicians involved, and the problems in industrial medicine outside the sphere of the physician's ordinary interest and experience, all tended to impede the attainment of the highest efficiency in the practice of medicine in industry. In a surprising number of instances the difficulties encountered were overcome by indefatigable and enterprising physicians who, through unremitting effort, found the means of solving questions for which no precedent existed. Indeed, the work of many men has so contributed to the definition of this field that it may now be said that industrial medicine has clearly emerged from the chaos of earlier days into a fairly well defined area of medical practice with its own specific and indispensable requirements as to the preparation and the ability of the practitioner. In a sense, industrial medicine does not constitute a specialty analogous to others which have already evolved in the history of medicine. It would be rather difficult to draw comparison with dermatology, psychiatry, surgery, or internal medicine. There is no established specialty from which this relatively new bidder for recognition does not borrow. However, the sum total of the knowledge which touches upon medicine in industry and the sum total of the skills which medical practice requires, converge upon many problems which are not usually experienced, or at least not met under the same guise or solved in the same manner in other branches of medicine. Moreover, industrial medicine is closely allied to a variety of engineering problems and sociological and legal questions which are in great measure peculiar to it and which tend to distinguish it from other medical provinces.

As already stated, many of the accomplishments in industrial medicine have been of high order, but the training which made these accomplishments possible has very largely been of the type inherent in the work itself. That is, it has been training resulting directly from the job itself and not anticipatory to it. We are forced to concede that no form of pedagogy has ever approached the efficiency of practical on-the-job training. But, inevitably, such training involves the incalculable waste of trial and error, and the slow and painful evolution of guiding principles. It is, therefore, not merely legitimate but also highly desirable that the fund of information and the body of skills which have been evolved should be amalgamated into a course of instruction for the suitable preparation of men who will dedicate themselves to industrial practice. As in all of medicine, such a course must combine theoretical and practical knowledge and the ability to do. Here, as elsewhere, we think of the physician as the individual informed in respect of the character of his work and endowed with the ability to act in conformity with the best knowledge available. These criteria were kept in mind in the formulation of the course of study of industrial medicine which is here announced. This course is being offered to suitable candidates under grant of a fellowship by the James S. Kemper Foundation. It is so planned that it will train the applicant to become a Doctor of Industrial Medicine in the fullest implication of the demands which this field makes upon its incumbents at the present moment.

The course involves first of all rotating service in an industrial medical department lasting 12 weeks. Here the student will concern himself with general emergencies, the various types of physical examinations performed in industry, health hazards, health education, nutrition, safety engineering, records, compensation laws and procedures, and industrial and public relations. Following this introduction, eight weeks will be spent with the Industrial Hygiene Foundation in the study and observation of matters relating to plant surveys and the guidance of laboratory and other pertinent procedures. The third phase of the course will consist of four weeks spent with the Pennsylvania State Health Department in the study of its organization, the character of state control of industrial hygiene, and plant investigations as performed by the state. Then, because of the tremendous importance of chest pathology in industry, a period of 12 weeks will be spent at the Tuberculosis League Hospital, Pittsburgh, Pennsylvania, in the study of tuberculosis and other diseases of the chest. During this time the student will be in residence at the hospital and will have full opportunity to observe the manifestations of chest diseases and the procedures for their care and their prevention.

Dermatological knowledge is one of the more insistent demands which industrial medicine presents. In order to give some familiarity with this field, the course includes service in the Dermatology Department at the Falk Clinic, Pittsburgh, with special reference to the contact dermatoses and investigation of the etiological factors in industrial employment.

One month is spent in the study of cardiovascular diseases. Attendance at the Heart Station of the Magee Hospital, Pittsburgh, will be required. In this part of the course, the student will be concerned with

diagnosis, treatment, and follow-up of cardiovascular cases. This phase of medicine has become of great importance, particularly in view of the presence of large numbers of supervisory and other employees in industry who have attained an age where cardiovascular disturbances tend to appear. In addition, there is an obvious need for a better understanding of cardiovascular diseases in a population group which exhibits an increasing average age.

More emphasis will be given in the future to the psychiatric aspects of medical practice. Training in psychiatry has become an indispensable factor in the success of the industrial physician. Provision for some exposure to this field is made by allotting a period of four weeks for psychiatric study at the Pennsylvania Psychiatric Hospital.

Because of the fact that traumatic surgery remains one of the most important branches of medicine in industrial practice, provision has been made to place a student in residence for a period of 26 weeks in one of the hospitals affiliated with the University of Pittsburgh in order that he may study and observe first hand, cases of minor and major traumatic surgery. There will be extensive opportunities for observation of procedures for the rehabilitation of the injured. Considerable time will be spent in the study of physiotherapy and of orthopedics.

In addition to the program outlined above, the student will be required to participate in such classroom duties connected with the teaching of classes in industrial medicine at the University of Pittsburgh Medical School as his training and abilities may permit. The student will furthermore be required to attend certain national meetings relating to industrial medicine in order that he may familiarize himself with the organizations concerned with the guidance of this field and with the progress made therein.

The course of training which has been described contemplates the preparation of physicians not merely for the immediate tasks they will be called upon to perform in industrial medicine; it undertakes the preparation of men who will be fitted to improve upon present practices and to contribute to the further progress of this field.

Chrysler Corporation Routine Eye Treatment Technique

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IN THE various plants of Chrysler Corporation a large number of nurses and physicians treat eye injuries. Our problem consists of providing proper, uniform treatment technique and arranging proper integration among nurses, plant doctors and ophthalmological consultants. Additionally, where a full-time physician for reference of eye injury cases is not available, a precise delineation of the nurse's functions and limitations is necessary.

The following standard ophthalmic procedures were developed in our Medical Department in Detroit, Michigan. These procedures are supplemented by individual instruction to physicians and nurses.

Standard Ophthalmic Procedures

Foreign Bodies

WHEN an employee presents himself alleging a foreign body in his eye, the following procedure is recommended:

I. *First Day:*

1. Instill two (2) drops of ½% pontocaine into the eye to allay pain and permit thorough examination without the danger of blinking. Wait for the pontocaine to take effect.

2. Examine eyeball and eyelids carefully with magnifying lenses. Follow a definite routine. Evert lower lid and examine. Examine eyeball, instructing employee to look up,—down,—to right,—and to the left. Evert upper lid and examine. When foreign body is discovered, note its location, character and size. Decide whether the foreign body is *loose* or *imbedded*. Note carefully if there is any abrasion of eyeball. The possibility of *two* foreign bodies being present should always be considered.

3. If foreign body is *loose*, remove with toothpick applicator. (See General Instruction c.) Irrigate eye with sterile, normal saline. Instruct employee to return immediately if he has any pain or discomfort in eye. If so, refer to physician.

4. If foreign body is *imbedded*, so that it cannot be removed with a swab or applicator, it must be removed with a spud. Refer to physician when he is available. Use of a spud in removing foreign bodies from the cornea is similar to the use of a swab except that more damage to the cornea can be done with a spud and therefore more care must be exercised. (The use of eye spuds by nurses as described here is a war-time procedure.)

To avoid unnecessary damage to the cornea, attention must be given to two seemingly insignificant details: First, *anesthesia* must be adequate, and, second, the foreign body must be located and *kept in view* while its removal is attempted. A spud should never be used on an eye which is not completely insensitive and it is well to demonstrate to the patient that he will feel no pain. This can be done by gently touching the "white of the eye" with an applicator. The patient then knows that he will feel no pain and he will be better able to hold his eye quiet.

The choice of the spud is left to the discretion of the operator. However, it is felt that the small "golf club" shaped spud is easiest to manipulate and is small enough not to cause excessive damage to the cornea.

So-called imbedded foreign bodies are not actually "imbedded" in the corneal tissues. They have merely penetrated the epithelium or outermost layer and are stuck on the surface of the cornea. Therefore they cannot be removed without purposely making an abrasion with the spud. It is important to keep this abrasion *as small as possible*. To remove the imbedded foreign body, the end of the spud should be placed on the cornea beside the foreign body, and the foreign body lifted out by sliding the spud under it. If properly done, this will serve to dislodge the foreign body and it can then be wiped off with a swab in the usual manner. Only a small abrasion need be made. No attempt should be made to pick up the foreign body with the spud since this will only cause repeated small abrasions. Do not "chase the foreign body" across the cornea with the spud—wipe it off with the swab.

After the foreign body has been removed, there is frequently a small black or brown ring at the bottom of the abrasion. This may be removed by gently scraping with the tip of the spud. If it does not

come off easily, it should be left. After 24 or 48 hours, the cornea softens and the "ring" tends to slough off. At this time it can be picked off much more easily. Damage to the cornea is done more often by attempting to remove the stain than by leaving it.

After the foreign body has been removed, the eye should be flushed with saline. If the abrasion is a small shallow one, the patient may return to work and he should be warned not to rub his eye with dirty fingers or gloves. He should be told to return at the end of his shift. When he returns the eye should be thoroughly flushed with saline and the patient instructed to return at the beginning of his next shift.

If the abrasion is large or deep, the patient will probably have enough pain to prevent him from working. These cases should be sent home. The eye should be flushed with saline, some holocaine-metaphen ointment instilled, and an eye pad applied. In cases where the patient is driving his own car home, he should be given the eye pad and told to apply it when he reaches home.

Eye pads should be applied so that they exert firm pressure on the closed eyelids. A small eye pad, which will fit snugly against the closed eyelids, under the prominence of the upper bony margin of the orbit and against the side of the nose, is better than a large one. Two strips of adhesive tape should be applied beginning at the center of the forehead and passing across the eye pad to the cheek. This will hold the pad firmly in place. If necessary, a third strip can be placed horizontally across the bridge of the nose.

Patients who are sent home are to be instructed to return to the Medical Department the following day.

No difficulty will be encountered in dealing with foreign bodies of the cornea if attention is given to the following:

(1) Anesthesia.

(2) Visualization of the foreign body.

(3) Care in the use of the spud to avoid making a larger abrasion than necessary.

(4) Cleanliness of the eye during and after removal of the foreign body.

5. If the employee states that "something" hit his eye with great force, and you are unable to locate any foreign body, or "rust" stain, or abrasion, instill 2% fluorescein into the eye, wash out excess with normal saline, and examine carefully. If there is *any* area of staining, refer to physician. This is especially important, as it may mean that a foreign body has penetrated into the interior of the eyeball. Be sure to recognize a penetrating foreign body in *every* instance. The history of the injury is helpful in this regard. Intraocular foreign bodies are not apt to result from grinding or lathing operations but more likely result from pounding or chiseling procedures. An intraocular foreign body should be suspected in any case in which the vision is moderately reduced; in any case in which the normal shape of the pupil is altered; or in any case in which there is a large amount of subconjunctival hemorrhage.

II. Second Day:

1. Install fluorescein into eye and wash out excess with saline. Observe if foreign body area stains.

If there is no staining, employee may be discharged. If foreign body area stains, instruct employee to return again at the end of the shift. Instill fluorescein, and if area still stains, put in holocaine-metaphen ointment and instruct him to return at the beginning of his next shift.

III. Third Day:

1. Stain with fluorescein. If foreign body area stains, or if it appears larger, refer to ophthalmologist immediately.

General Instructions

IN ALL CASES of foreign body of the eye, exercise the *utmost* gentleness.

Use a sterile, small blunt-end eyedropper for each patient. After using, rinse dropper in water and place in container for auto-claving.

Bottles for eye solutions are to be glass stoppered and not the dropper type.

Do not point eyedropper directly in front of eyeball. The patient may blink or jerk, thus chancing an injury to his eye. Instead, approach eyedropper from the outer side, holding dropper horizontally with rubber tip away from patient. Have patient look up and away from the dropper. Instill solution into the outer corner of the eye.

Do not use large, fluffy cotton applicators. The cotton fibres are apt to remain on the eyeball and set up an inflammation. Instead, use tightly wound cotton on the small end of a toothpick. Moisten applicator in saline before using, and remove excess moisture by wiping on gauze.

All eye solutions are to be autoclaved once a week, except 3% ephedrine (aqueous) and 1:1000 adrenalin, which can be obtained from the central pharmacy.

Indicate on the employee's health record the exact location of a foreign body. For example: "1 mm. loose steel chip, right eye, at 5 o'clock. Foreign body removed," or "1 mm. steel chip, imbedded—removed, eye pad applied," or "Patient alleges foreign body right eye. No foreign body seen. Minute area of staining after fluorescein at 11 o'clock," etc. If a foreign body is removed, it should be so stated on the record.

Under no circumstances should a patient ever be given pontocaine or other local anesthetic to use in the eye at home. If medication is desired, bathing the eye with warm solution of boric acid (one tablespoon to a pint of water) may be prescribed. Some patients are relieved of pain by hot applications; others prefer cold. Sedatives in the form of Nembutal or bromides may be given to help promote sleep. The best thing is to keep the eye clean and covered.

The responsibility for very severe or difficult cases should not rest entirely upon the nurse or plant physician. Consultation in such cases may be had by calling one of the consulting ophthalmologists.

Whenever dark glasses are dispensed, please notify plant safety supervisor. This is to prevent such glasses being worn on jobs where better eye protection is necessary.

Formulary

ZINC SULFATE is a powerful astringent to mucous membranes. By instillation in 1/5% solution it is employed in blepharitis and conjunctivitis. The solution is colored with a minute amount of brilliant green for purposes of identification.

2. PONTOCAINE HYDROCHLORIDE is employed as a local anesthetic in solution of ½%. It does not produce local vasoconstriction. It is instilled into the conjunctival sac prior to examination for corneal abrasion or foreign body to render the examination and the removal of the foreign body painless. The solution is colored with a minute amount of gentian violet for purposes of identification.

3. FLUORESCEIN SODIUM. The soluble disodium salt of fluorescein is used in 2% solution for the detection of corneal lesions and the detection of imbedded foreign bodies. The dye stains lesions of

the corneal epithelium, but not the intact epithelium.

4. EPHEDRINE SULFATE. Solutions of ephedrine sulfate are employed for their stimulating action on the sympathetic nervous system. A 3% solution produces mydriasis without cycloplegia when instilled into the conjunctival sac. This mydriasis is not produced in the negro. It is used when moderate dilatation of the pupil is desired for ophthalmoscopic examination. *This drug is intended for use only by the physician.*

5. PHYSIOLOGICAL SALT SOLUTION (ISOTONIC) is used as an irrigating fluid to remove secretion from the conjunctival sac. It should be used copiously and frequently following chemical burns of the eye and may be used to remove excess fluorescein which has been instilled.

6. HOLOCAINE HYDROCHLORIDE 2% AND METAPHEN 1:3000 OPHTHALMIC OINTMENT. A non-irritating antiseptic ointment rapidly producing local anesthesia of long duration when applied to mucous membranes, and especially to the cornea. It is used after removal of corneal foreign bodies and in corneal abrasions and other painful ocular conditions.

7. SULFATHIAZOLE. An ophthalmic ointment of sulfathiazole 5% is employed in conjunctivitis, blepharitis, and corneal ulcer due to pyogenic organism, especially staphylococcus.

8. ADRENALIN 1:1000.

9. HOLOCAINE HYDROCHLORIDE 2% AND EPINEPHRIN 1:1000. Ophthalmic ointment used after severe flash burns.

Acid or Alkali Burns

IRRIGATE eye with copious amounts of saline. Instill fluorescein and if cornea takes a stain, refer to ophthalmologist.

Flash Burns

ACTINIC Kerato - Conjunctivitis: Once the diagnosis is made, instill ½% pontocaine in the affected eye. Then instill one drop of 1:1000 adrenalin into the eye three times at five minute intervals. If the case is seen soon after the onset of ocular pain and before vascular congestion is marked this is all that is necessary.

If congestion is marked, or if the case is a late one, follow the above routine and also give holocaine and epinephrin ointment to be used in the eye every three hours.

If the burn is so severe as to cause chemosis, purulent discharge, or a miotic pupil, refer to ophthalmologist.

Referrals

THE patient should be referred immediately to the consulting ophthalmologist when any of the following conditions arise, or are suspected:

1. Suspected intraocular foreign body. Before such a case is referred, a flat-plate x-ray may be made of the eye and the consulting ophthalmologist should be given the results as soon as they are available.

2. Alleged contusions to eyeballs, to determine presence or absence of

(a) Separation of retina.

(b) Hemorrhage into macular or other regions.

3. Complaints of poor vision from alleged factory condition.

4. All head injuries, demonstrable or alleged.

Please briefly record negative as well as positive findings.

Sterile Eye Procedure

THIS revised technique is to be used in ALL cases. Any eyes which are markedly inflamed are to be seen at once by the physician.

This technique consists of having an extra small table in the eye room. This is the "dirty table," and has upon it two containers. A pan, padded with cotton and containing a strong solution of green soap, is for used spuds, droppers, etc. Another receptacle will receive the unused, contaminated gauze which can be autoclaved for reuse. Also remove the arms from the eye chair.

The regular eye room table is the "clean table."

Added to the regular equipment must be a pair of sterile handling forceps in alcohol. Because of the possibility of its becoming contaminated, the irrigating bottle should be kept on the "dirty table." It should be re-sterilized when empty before being refilled.

The procedure with a patient is as follows:

Remove the patient's record from the file so that he may be free to leave after treatment.

Instruct the patient to sit in the chair without touching anything in the room.

A paper towel is then unfolded and placed on the "dirty table" with the crease of the towel up, forming a ridge. Do not touch the "dirty table" during the placing of the towel.

With the sterile forceps the material expected to be needed for treatment of the particular patient is chosen and placed on the paper towel on the "dirty table."

For example, a sterile spud is placed on the towel, sterile droppers are filled with pontocaine, etc. Place the stoppers with the open ends resting on the ridge of the towel to prevent the solution from running out. Place the moistened swab on the gauze squares so that the towel will not become wet. If the use of ointment is indicated, squeeze a small quantity on to the end of a swab.

The clean forceps are then returned to their alcohol bath, the operator puts on the magnifying glasses, and is finished with the "clean table" and must under no circumstances return to it until he has scrubbed. If anything should be found lacking on the "dirty table," once the operator is contaminated, a second person could place the needed material on the "dirty table."

The light is turned on and adjusted while the operator is still clean. The examination and treatment are then carried out with the operator passing only between the patient and the "dirty table." The operator must touch nothing else. Under no circumstances must the spectacles, light, or "clean table" be touched.

The treatment finished, the patient is free to leave—without touching anything in the room. The operator then clears the "dirty table," places spud and droppers in the soap solution, gauze in the container provided for its receipt on the "dirty table," swabs and paper towel in the waste can. The operator is now ready to scrub.

Scrubbing with a brush is carried out for one full minute by the clock and no less. This is essential for the protection of the operator as well as the next patient. *After* scrubbing, the spectacles are removed and placed back on the "clean table," and the light turned out.

Only paper towels are to be used in the eye room.

In summary, this technique consists of a sharp division between the "clean" and the "dirty" parts of the eye room equipment. Cross contamination must be vigorously guarded against. Nothing must ever pass from the "dirty table" to the "clean" one.

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The Value of Cardiograms

—As an Aid to Early Diagnosis in Suspected Cardiovascular Emergencies—

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SINCE no one can predict the time or place at which heart attacks will occur, it is obvious that in only a small percentage of cases is it practically possible to make electrocardiographic tracings within a few moments of the emergency. In the majority of cases, the first electrocardiogram may be made several days or even weeks after the attack. Consequently, there is, at the present time, in spite of much study of the subject, some doubt as to the diagnostic value of cardiograms taken during the acute stages of coronary occlusion.

This situation need not hold when the potential patient is as closely associated with hospital facilities as he is in an industrial plant with proper medical supervision. Today a number of industries make use of electrocardiographic equipment routinely in preplacement examinations and periodic physical examinations, especially on employees over 45 years of age. In addition, cardiograms may be taken on all employees showing any evidence of heart disease regardless of age, and, finally on all employees who request emergency treatment or advice at the plant dispensary with symptoms resembling acute heart conditions.

Although a great deal can be said about the value of cardiograms in all three of these situations, the most valuable information has resulted from a study of the third group of cases. This report will, therefore, be limited to a group of 31 employees who reported during a five-year period to the plant dispensary of one industry, presenting symptoms resembling acute coronary occlusion. In all these cases tracings were taken and interpreted within 15 minutes following the onset of the attack.

Naturally, the symptoms of this group were variable and some were definitely atypical. Three of the coronaries had no precordial distress, and only three of them were brought to the plant dispensary on stretchers; the remainder either walked to the dispensary alone or with assistance. They were all put to bed on arrival in the dispensary ward, and the electrodes applied immediately. The treatment was entirely symptomatic and included one or more of the following: morphine, aminophyllin, coramine, adrenalin, caffeine sodium benzoate, digalin, amyl nitrite, nitroglycerine, and oxygen. In some cases tracings were taken prior to medication; most of them, however, were taken within a very few minutes afterwards.

Although space does not permit publication of tracings and reports on all cases, the following have been selected to demonstrate the representative results:

CASE NO. 1: Male; age 42; weight 159; height 5 ft. 5 in.; employed as office worker. Previous history and annual physical examinations since 1934 negative except for a gradual elevation of blood pressure from 135/84 to 150/88. No previous cardiograms were taken.

This employee walked (escorted) to the plant dispensary, complaining of intense pain in his upper anterior chest. He was put to bed immediately in the ward and the electrodes were applied within a few minutes. Morphine sulphate, gr. ¼, was given hypodermically about 10 minutes after admission. He stated that he shoveled snow before coming to work and walked briskly to place of employment in a snowstorm. He felt slight precordial distress just before arriving at the plant, and after reaching the office the pain became much worse. He was ashen gray; perspiration on his forehead; skin cold and clammy; pulse 100; respirations 20; blood pressure 160/94; temperature 98; heart sounds were forceful—accentuated A_2; no murmurs were heard.

First Cardiogram (A) taken at 9:30 A.M.—graphic interpretation:—lead 3 shows a marked prolongation of the R-T Segment and a biphasic T wave; there is a small Q_4 and a biphasic T_4.

Cardiogram B taken at 12:30 P.M. the same day—patient still in bed; shows a lowering of the R-T segment in lead 3 and a high R-T_4.

Cardiogram C taken at 3:00 P.M. the same day—shows normal complex in lead 3 but a persistent high R-T_4.

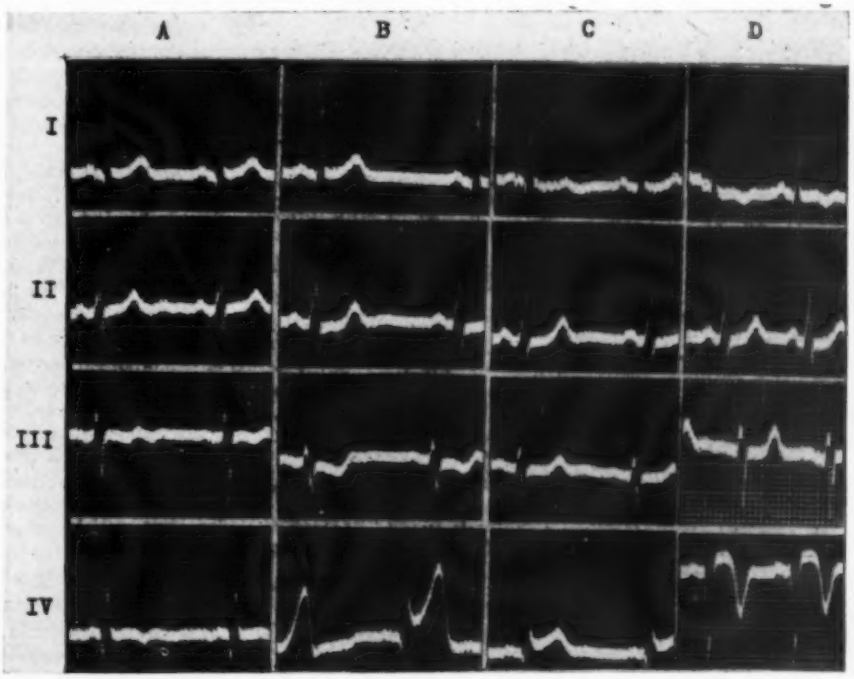
Employee was transferred by ambulance to a local hospital where he remained at complete bed rest for 47 days.

Cardiogram D taken upon discharge from hospital shows a coved T in lead 1 and a deep coved T in lead 4.

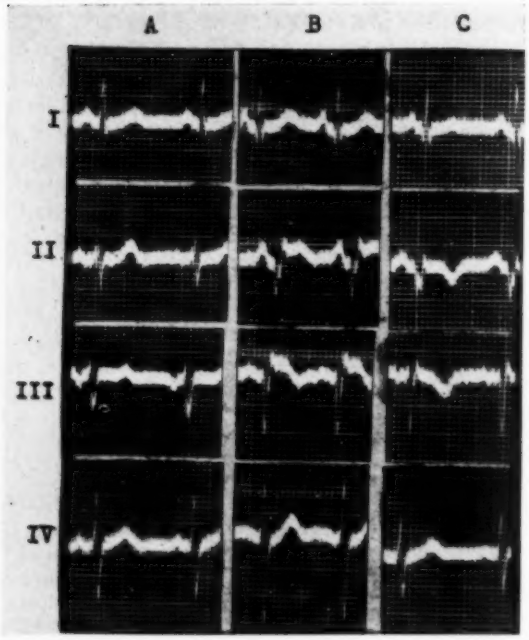
Graphic and Clinical Conclusions: The first three tracings are those seen with myocardial ischemia and may be due to coronary sclerosis or coronary occlusion. The last cardiogram shows the type of tracing seen with an old or healed anterior wall infarction.

Total cardiographed cases with suspected coronary occlusions..	31
*Total cases showing evidence of acute coronary occlusions.....	16
Total cases showing ECG evidence of other cardiac conditions.....	6
Total cases showing no ECG evidence of cardiovascular disease.	9
Final Diagnosis:	
1. Coronary occlusions	16
2. Anginal seizures	2
3. Coronary sclerosis	2
4. Auricular fibrillation	1
5. Supra ventricular tachycardia	1
6. Conditions other than cardiovascular	7
7. Undiagnosed	2
Total	31

*Eleven of the 16 had cardiograms interpreted as negative on previous physical examinations.



Case No. 1



Case No. 2

CASE NO. 2: Male; age 60; weight 182; height 5 ft. 8 in.; previous annual physical examinations since 1934 entirely negative; previous cardiograms negative; occupation, draftsman.

He walked unescorted to the plant dispensary immediately after lunch, complaining of pain in the left side of neck, left jaw, left arm, and at the lower tip of the left scapula. Pulse 110; blood pressure 150/90; temperature 98.6; respirations 16; skin was clear, good color, ruddy complexion. Patient was put to bed and electrodes applied immediately.

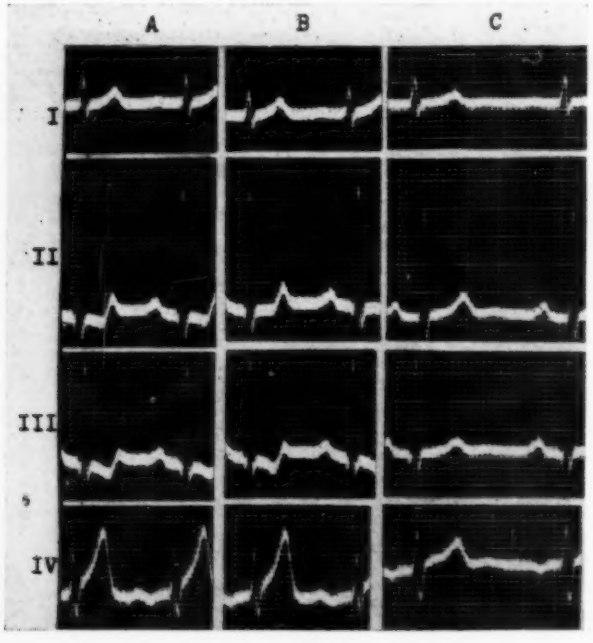
Cardiogram A was taken a year prior to his attack and may be interpreted as negative.

Cardiogram B, taken on admission to the plant dispensary with the above complaints, shows a high R-T segment in leads 2 and 3 and a Q_3.

Employee refused hospitalization and was taken home by car. Two days later he was admitted to a hospital because of persistent precordial pain.

Cardiogram C was taken 35 days later, during which time he was at complete bed rest, and shows Q_3 and negative T_2 and T_3.

Graphically and clinically this employee had a posterior wall infarction.



Case No. 3

CASE NO. 3: Male; age 57; occupation, machinist; weight 127; height 5 ft. 7 in.; previous physical examinations over a three-year period showed mild hypertension averaging 145/85 and a mitral systolic murmur at the apex.

This employee was seized with sudden severe pain in the heart upon his return from lunch. He collapsed from weakness and pain with no loss of consciousness and was brought to the plant dispensary on a stretcher. He was put to bed immediately and electrodes applied. Pulse 110, feeble; temperature 98; blood pressure 148/78; heart sounds were poor and distant. One ampule of amyl nitrite gave only slight relief; morphine sulphate, gr. ¼, was given later hypodermically.

Cardiogram A, taken within a few minutes after arrival at the dispensary, shows a lowering of the R-T segments in leads 2 and 3 and large T waves in lead 4.

Cardiogram B, taken 15 minutes later, shows practically normal complexes in lead 2.

The employee was taken home and advised complete bed rest for two weeks.

Cardiogram C, taken five days later, may be interpreted as perfectly normal. Physical examination made at this time was also negative. Patient was advised continued bed rest for another week or 10 days.

The next day, however, the employee died very suddenly during an attack of severe precordial pain.

Graphic and Clinical Conclusions: On the basis of the negative third cardiogram the first two were interpreted as an anginal seizure, which is frequently the forerunner of a true coronary occlusion.

Conclusions

CARDIOGRAPHIC evidence of coronary occlusions and angina was obtained during the attack in 18 of the cases studied. From the results we are convinced that many lives can be saved or prolonged by taking electrocardiographic tracings immediately on individuals presenting atypical or questionable symptoms of acute coronary disease. We believe that organizations having cardiograph equipment will find it very useful as an aid to earlier and possibly immediate diagnosis in certain suspected cardiac emergencies.

Report of Union Health Center, 1943

IN THIS booklet of 108 pages lies a great deal of useful and interesting information concerning the administration and experience of the Union Health Center, which was established by the International Ladies Garment Workers' Union 31 years ago.

A description of the clinic, organization and staff, attendance, and the various types of medical services, is given; also the details of the sickness insurance program, morbidity, various surveys, health program planning, and a financial report.

During 1943, some 45,000 persons received some type of medical care at the center, the patients who sought diagnostic and therapeutic services numbering over 21,000. Of the latter, 7,762 came to the center for the first time in 1943. Women made 63% and men 37% of the total number of visits to the clinic during the year 1943.

An idea may be obtained of the growth of the clinic since 1913 by comparing the 1234 visits made in that year with the 116,185 visits made in 1943.

Well expressed by DR. HAVEN EMERSON in the forword is the following epitome: "In the social and economic sense it may be that the contribution of DR. PRICE was at least as great as for medical purposes, for he was a devotee of the oft neglected virtue of organized thrift. While the merchants of the city urged upon the people an installment system of buying more than they could afford of goods and the conveniences of the household, DR. PRICE made it popular to invest in the enduring satisfactions of good health through pre-payments by groups of persons whose entire livelihood and security of existence depended upon their most precious asset, personal health."

—C. O. SAPPINGTON, M.D., DR.P.H.

Extended Medical and Hospital Service in Industry

—Symposium at the 29th Annual Meeting of the American Association of Industrial Physicians and Surgeons, St. Louis, May 10, 1944, Dr. M. N. Newquist, Medical Director, Texas Company, Presiding—

What Is Extended Medical Service

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New York

AT THE risk of treading familiar ground it would seem necessary, first, to establish a base line of concepts as to what constitutes industrial medical service at the present time. Granted that there are many variations due to our continually changing social structure, and particularly at present because of war conditions, I believe the majority concerned would not find too much disagreement in the following outline as to the scope of an industrial medical department's activities.

1. *Pre-placement examinations.* The objective of the pre-placement examination is to use the facts obtained from a history and physical examination in determining whether the individual applicant can in a major way work at a particular job in a particular industry without doing harm to himself, to others or to property and service. Used in this manner, those of us in the industrial medical field are in general agreement as to its universal application. I have confidence that with the emphasis on placement, and with proper explanation and education, the objections to this type of examination on the part of a fraction of the organized labor groups will disappear.

2. *Direct care and/or supervision of all disabilities arising out of and in the course of employment.* This takes cognizance of the fact that there are various statutory or regulatory provisions providing for the employee to exercise his right to have any physician of his choice, or the so-called "free choice of physician." In this respect it has been our observation that it matters little to the employer who chooses the physician but that his primary interest is to see that the injured employee receives competent medical care. The extent of medical care in these instances actually carried out by the industrial medical department will naturally depend upon the facilities at hand and presumes, fairly I believe, an intelligent and human approach on the part of industrial management to see that the injured or ill employee in this category receives the best available medical attention, utilizing outside facilities as indicated.

Other activities of the medical department which might be called purely medical work in industry are:

1. Emergency sickness cases.
2. Counsel and advice on sickness problems.
3. Diagnostic service.

There are, in the course of every working day, many individuals with minor ailments of a nature not severe enough in their judgment to cause them to stop work or to seek the advice of their private physicians. In these instances emergency first aid treatment allowing the individual to continue with his job in greater comfort and with more efficiency is a generally accepted procedure.

The question of counsel and advice on sickness problems as a function of the industrial medical department would seem to require little comment in this discussion. H. M. Vernon[1] states that one-third to one-sixth of all causes of sickness experienced by industrial workers are due to psychological disorders, such as anxiety states.

It would seem that the industrial physician who is intimately familiar with the work environment and occupational requirements in his industry would be in the most advantageous position to care for this type of individual, inasmuch as counsel and advice are the essentials in treatment except for the major psychoses. Furthermore, the majority of individuals with minor nervous maladjustments do not get into the hands of their private physicians, except rarely.

Under diagnostic service, for purposes of brevity, we might make two categories, (1) periodic health examinations or appraisals, of employees, with or without x-ray, and (2) clinical laboratory examinations and x-ray and clinical laboratory facilities in the industrial medical department.

With respect to the former, there is, I believe, little question as to the mutual advantages obtained and as to the desirability of a program of this type being included in the health program in industry. Dr. Victor Heiser, reporting on a survey by the National Association of Manufacturers, showed "a 45% reduction in accidents, a 63% drop in occupational disease, and 30% less absenteeism in those companies having established health programs. The labor turnover was reduced by 27%."

With regard to diagnostic x-ray and clinical laboratory facilities, we believe they are not only justifiable but also constitute good medical practice, and their use resolves itself in good personnel relations with the employee and good relationships with the outside physician. These facilities in an industrial medical department, of course, are predicated on the fact that there is a sufficient number of employees available to the department economically to justify their installation. It is not suggested that these facilities are justifiable for a medical department in small industries. There are, however, in some industries irrespective of size, toxicological and other hazards which make necessary the provision of diagnostic laboratory facilities as a protective measure for their employees.

Before undertaking the diagnostic study of any case, the medical department should get in touch with the family physician. If the case has been considered of trivial nature and the family physician has not been brought into the picture, diagnostic studies may constitute the first step in the procedure. The criticism has been made that x-ray work done in industry deprives commercial x-ray laboratories or roentgenologists of this work. This we do not believe to be true. Much of the work of this sort would not be done if industry did not do it. It should be understood that employees are not offered unlimited diagnostic service. Each case is considered on its merits. Considerable diplomacy and tact are often necessary in bringing the outside doctor in on the situation, but in the long run the employee is going to be the gainer, and industry is going to make an additional friend of the doctor and, incidentally, increase good public relationships to an extent incapable of being estimated. Furthermore, the doctor is going to gain because of this information handed to him to enable him better to carry out the necessary steps in conducting the case.

I have limited this discussion to activities of a

purely medical nature. It should go without saying that other industrial medical department activities include collaboration with management for the provision of healthful working conditions and employee education in personal hygiene, accident prevention and similar related activities.

As to the definition of an extended medical service, I quote from a brochure prepared by Dr. M. N. Newquist[2] as follows: "An industrial medical service is considered to be 'extended' if it goes beyond the routine pre-employment and periodic physical examination, the preventive and curative measures for industrial injuries and occupational diseases and reasonable first aid and advice for non-industrial illnesses and injuries while on duty." Of the 925 companies surveyed in 1932 by the American College of Surgeons, 19% provided extended medical service, according to the above criteria. This brochure was published in 1938 and it further states, "the purpose and license of industry is not to practice medicine. An unjustifiable encroachment upon either the diagnostic or therapeutic phase of the practice of medicine is a challenge to the progress of American medicine whose standards have always held that the physician should secure his patients on a basis of professional excellency rather than by economic barter."

In considering the question of extension of medical services, we first must admit that the entire practice of medicine is being re-shaped by powerful socio-economic forces both from within and outside of the profession. This is probably as it should be, for nothing should remain static and progress cannot take place without change. At the present time, it appears that the objective is to make better medical service available to larger numbers of people and the mechanism is through the medium of insurance. Keeping the discussion limited to medical service in industry, such service might be divided into four broad classifications.

1. Medical services supported entirely by management.

2. Medical services supported by mutual benefit plans in which employer and employee make contributions.

3. Medical services supported by voluntary employee insurance participation, management playing a passive role usually by supplying space and/or certain other physical facilities.

4. Medical service on a compulsory insurance basis.

In the concept just delineated, I believe, in the majority of instances, the scope of service would fall into Class 1 and, in my opinion, should be limited as outlined. The scope of any of the other three plans might easily expand to unlimited lengths, up to complete hospitalization and medical and surgical care for employees and their families, such as will undoubtedly be presented to you later in the program. There are a great many factors to be considered on this whole question, and I do not believe it possible to blueprint a formula to fit all situations. To indulge in a platitude, progress in a subject such as this should come through evolution rather than revolution. There are some who consider the problem as follows: Granted that industry is in the business of the production of goods and services and not in the practice of medicine, and granted it is true that the most important machinery in the production of goods and services is the human machine, therefore, why should not industry go all out in its effort to maintain the human machine in the maximum state of efficiency and repair by seeing to it that every employee has complete medical and surgical service? There may be some situations in which this is justified because of geographical locations and non-availability of adequate medical service, as has been the case in some of the war-born industries, but does not obtain in a metropolitan center. One type of medical service which may adequately care for industrial employees who are under one roof, or where one community is composed of employees of one industry, may serve as a model for that particular situation and could not possibly be utilized for another industry with employees permanently located at hundreds of widely separated areas within one state or the United States.

In an appraisal of various types of extended medical service within and outside of industry on the insurance principle, there is apparently only one common denominator as to whether the plan is a failure or success and that is its administration, which at the present time in most instances resolves itself down to the individual or a very small group of individuals responsible for the administration of a particular plan. Assuming, for the moment that some plan or plans having a basic similarity could be formulated for complete medical service for industrial workers, that would still affect a relatively small proportion of our population. Using the inflated figures for the present time, the U. S. Department of Labor states there were approximately 37 million wage-earners as of January, 1944, exclusive of agricultural workers. Of this number about 13 million are represented by unions.

Interjecting another factor into the difficulties of applying any master plan of extended medical services to industrial workers is the fact that the 1939 figures of the U. S. Census Bureau which are the latest available, indicate that among the wage-earners in manufacturing in the United States 30% are in establishments employing 100 or less employees, 77.8% are employed in establishments of 1000 or less and only 22.4% in establishments employing over 1000.

And getting back to a take-off point, that is, medical services existing at present in industry, the American College of Surgeons in 1943 reports that since the beginning of their program in 1931, 1,849 different industrial establishments representing over five million employees have been surveyed, of which number only 59% have been fully or provisionally approved. This indicates that, considering industry as a whole, there has been a relatively small amount of experience in conducting a medical service even along conservative standards, as previously outlined. Again assuming that any extended medical service in industry would be administered from within industry, it would hardly seem that there has been enough experience to expand on any large scale. Reverting to the methodology of expansion on the insurance principle, I do not believe that industry is by any means ready or in a position to consider the compulsory insurance method. The only way this method might be applied would be on a national scale and, as yet, to my knowledge there is no organizational set-up provided for adequate and competent administration of such a plan.

Experience in the past with extended medical service underwritten by industry has not proved successful except in very isolated instances and for the most part spasmodically. Such a type of service has more frequently been characterized by unappreciated paternalism and, with extended unionization, paternalism is being less and less appreciated.

Dr. Leonard Greenburg[3] has aptly summarized the types of agencies that have a role in the program for the conservation of health of the industrial worker. These are:

1. Industry—the plant medical department, National Association of Manufacturers, local manage-

ment groups, and local chambers of commerce.

2. Labor groups and unions.

3. The medical profession and private practitioner; city, county and state medical societies and the American Medical Association.

4. Voluntary agencies, such as tuberculosis and health associations, and

5. Official agencies—Divisions of Industrial Hygiene and Departments of Health.

To this I would add that industrial management should have a sympathetic interest in voluntary insurance plans developed by outside organizations, and sponsor participation of its employees in such plans after they have been carefully scrutinized and studied.

As previously stated, nothing is static and progress cannot be made without experimentation, and such experiments are to be commended, but I do not believe that any segregated experiences to date are amenable to broad application.

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CHAIRMAN M. N. NEWQUIST: The next subject, "Scope of Industrial Health Service Desired by Labor," was to have been presented by a representative of labor, designated by one of the large labor unions, but unfortunately at the last moment he was unable to be here. However, we have our good friend, DR. LEO PRICE, with us, who will speak on the subject of "Extended Medical Service Provided by Industrial Workers." DR. PRICE is medical director of the Union Health Center in New York and has had long experience. He has observed labor, their attitudes and their desires, and I am sure he can speak authoritatively on subject No. 2 as well as subject No. 3.

DR. LEO PRICE: I am afraid that I am not able to speak authoritatively from the labor point of view. My position as director of the medical institution that is run by industrial workers doesn't qualify me to speak for labor's attitude toward the controversial subject of medical service today, and I feel that I must tread very carefully on this ground.

I don't want to bring up the subject as I have heard it mentioned by many labor leaders with some of whom I agree and with others with whom I do not agree. However, I think if Mr. Watt had been here he would have definitely placed himself as favoring government inclusion in the matter of giving medical service to the entire population, and I don't want you to feel that that is my point of view. I am here as a physician acting in the capacity of consultant to a medical clinic.

Yesterday I had an opportunity to talk on the subject of workers' health education. In that paper I made a few remarks about trade unions in general and their points of view. Before I read the small passage which I offer you as a background, I want to say that at this particular moment there is a great movement on the part of labor unions in the matter of giving health service to their members. There have been contractual arrangements made where very large unions, including hundreds of thousands of workers, are receiving from industry a tax with which they are purchasing indemnity insurance for medical service. I know of three such contracts: one case involving 300,000 workers; another case, 100,000 workers; and another, 75,000 workers.

Whether these people would purchase indemnity insurance only if they had any other form of authorization, I cannot say. From one group I understand that they would be interested in service rather than indemnity features in an insurance contract, but, for the time being, with conditions as they are today, they find it most satisfactory and feasible to be assured their workers will have funds with which to pay for medical care when they need it, and they are insuring them in that way.

There are others who have made attempts at giving medical service to their members, but I don't believe that there has been any successful plan. By successful plan, I use the International Ladies' Garment Workers Union as an example. We have been giving service 31 years in a large clinic, which I will describe to you later, and we feel that we have given a limited service, ambulatory service primarily, to these workers to their entire satisfaction. Whether we could give more or not depends on a number of factors.

There is the matter of costs; funds are not available. There is the matter of policy. There is the matter of the medical profession now serving us as to how they feel about extended service.

These are all questions that we must consider very carefully before we make a step forward or backward.

Now, for those of you who were not here yesterday, I would like to read this short paragraph:

"Workers feel that of all possible agencies, their own union is the most trustworthy, even in deciding matters of medical care. Union leaders are beginning to realize that and consequently recognize their responsibility to the worker in the field of health. When you discuss unions all over the country you must understand that unions are not all similarly organized. Different unions have different structures. Some are old, and large, and powerful, and concentrated in one area. Others are small, geographically scattered, and struggling for their existence. Obviously those unions which are still newly organized, and concerned chiefly with bread and butter problems can't undertake the administration of medical care. I believe that the leadership in a great many unions is anxious to take some responsibility for the health education of its membership, but is often financially and mechanically unable to do so. Some unions, however, have already instituted health programs. Others are seriously considering such measures."

That is all I have to offer in the absence of the second speaker. I think I will continue with my paper on "Extended Medical Care Provided by Industrial Workers."

Extended Medical Care

—Provided by Industrial Workers—

LEO PRICE, M.D.,
Director, Union Health Center,
New York

WORKERS have been able to provide themselves with a source of medical service for 31 years. When similar service is provided by the employers rather than by labor, the outstanding difference lies in the motive.

The following paragraph from the National Association of Manufacturers' bulletin on health, published in January, 1944, expresses the employers' motive realistically:

"In peacetime, the health program, with its increased production and its marked reduction in cost in terms of less occupational diseases, fewer and less serious accidents, less absenteeim, lower compensa-

tion costs, less labor turnover and unrest *'pays in terms of dollars and cents.'"*

Labor, although it realizes the financial stake in its own health protection, goes one step beyond that. It realizes the stake it has in an individual feeling of security and self respect. Labor is also farsighted enough to assure the worker recourse to such health service not only when he is employed, but—more important—when he is unemployed and is less able than ever to stand the cost of medical care.

It is the express purpose of the Union Health Center to give the garment worker, through group medicine, good medical care—something which he cannot usually afford to purchase from individual practitioners and specialists.

A strike to eliminate sweatshops in 1910 resulted in the establishment of the Joint Board of Sanitary Control—which was empowered to develop standards to which both labor and management were committed. This was the first step toward a health program.

The second step was taken after the poor state of health existing among the workers was reported (in 1912) by the New York State Factory Investigation Commission, and, in 1913, by the U. S. Public Health Service. Both agencies found a high incidence of pulmonary tuberculosis and chronic upper respiratory conditions. There was also a high frequency of chronic ailments, poor hygienic habits, and so on.

On the basis of these reports the cloak pressers adopted a tuberculosis benefit plan. When that proved inadequate, because of the incidence of many other illnesses, a general sickness insurance plan was adopted. The skirt makers followed with a similar program, and in succeeding years other workers in different crafts developed health programs of their own.

Today—30 odd years later—21 of the 28 local labor unions of the ladies garment industry have some health insurance provisions.

Since the Union Health Center was established at the very inception, and for the specific administration, of these plans, it has expanded its facilities and extended its services as the growth of membership and the increase of needs demanded.

Originally, a great deal of the medical work of the Center consisted of pre-employment applicant examinations, certification of sick-benefit claims and periodic health examinations.

Under the industrial impetus given the garment trade by the National Recovery Act, many of the crafts inaugurated revised or extended sickness insurance plans. This increase in pre-payment for medical care in turn helped finance the cost of the expansion of the Union Health Center, so that, by 1943, 46,000 persons were given 116,000 services, as compared with 5,000 visits in the early years.

Occupying 20,000 square feet on two floors of a loft building in the heart of the garment industry, the Center is equipped with all modern facilities for distributing good medical care. The medical staff of four full-time physicians assisted by 80 part-time physicians, is backed up by 12 registered nurses and 50 other workers, including pharmacists, opticians and physiotherapists. General medicine and 18 special fields provide the type of medical care required by the members and their families.

The utilization of group medical practice, and the consequent concentration of costly and intricate diagnostic equipment permits more immediately thorough diagnoses as well as good medical services, with no basic increase in pre-payment cost to the patient.

The ladies garment manufacturing industry in New York City employs 162,000 workers. They are distributed among 5,000 shops, with an average of 30 workers to a shop. Therefore a centralized medical unit, supported by pre-payment plans, is the only answer to the problem of providing ambulatory medical service and control in such a scattered industry where the factory is a small unit. The Union Health Center, with its group medical practice, is organized to serve the entire membership of the 28 local unions of the International Ladies Garment Workers' Union in the city.

Each of the different local unions has its own health program. The cash assistance and services the workers receive vary with each local. The customary charge for the sickness insurance service is $4.20 a year, for which they receive a minimum of $7.00 a week for 10 weeks' disability, tuberculosis cash benefits of $150 to $350 and/or sanitorium care, and two periodic health examinations without direct charge. Workers belonging to unions without health plans may use the facilities of the Center at below cost fees.

From the worker's point of view, cash from insurance does not guarantee improvement of his health, nor of the quality or availability of medical care. For this reason, workers want health service. As soon as a plan is financially sound, instead of giving more cash benefits, we offer *medical* benefits in the form of pre-paid service, which is distributed through what we call "Medical Credits." Those plans which can give more than cash sick benefits, issue these medical credits in the form of certificates which allow us to give medical care of value from $2.00 to $15.00. With the introduction of the payroll tax levy, which I will describe later, some groups are increasing such medical benefits to $25.00, and some to unlimited diagnostic services. The fee schedule is low at the Center so that considerable service can be secured for the sums mentioned.

One group pays the Center for treatment of every case of syphilis we discover. Without divulging the name of the member to his union, the bill for services is paid from the health funds. Only the patient and the physician know the nature of the disease for which treatment is given.

Whenever circumstances permit, mass surveys of larger groups have been conducted. In this way thousands of chest x-rays, serological tests, and eye examinations have been made. Such surveys are, no doubt, the most important and valuable form of service to the mass of the workers in the industry, and consequently of value to the health of the community.

THIS is the proper time to present to you views on extended medical service, because the ladies garment industry is now securing from management a tax for health service. Employers have agreed to pay for the medical indemnity and service plans. Up to this time the Union Health Center has operated on funds collected solely from workers. Now garment workers will receive extended medical service from money supplied by management. The significance of such an arrangement cannot be overemphasized.

Management in small units is unable to develop an industrial health program such as is operated in industry with large plants. Under present labor shortage, management in this industry has no alternative but to accept and pass on to labor the responsibility of operating a health program from which they will also reap benefits of a healthier working population.

The willingness of this industry to cooperate with the War Labor Board on prices and wages eliminates a demand for higher wages, regardless of the man-

power shortage. The workers of this industry have learned through education by experience at the Center, to expect medical care of high quality which they are unable to purchase elsewhere. In order to meet this condition, labor and the manufacturers have reached an agreement to levy a payroll tax for a health program. This is attractive to the manufacturers because such assessments on industrial payrolls may be deducted from the income subject to high government taxes. The workers realize they are earning medical care instead of inflationary wage increases. The union organization controls the funds and structure and operates the plan. The usual amount set aside is 1½% of the payroll, although there have been agreements written in which a higher percentage has been secured.

It is my belief that the worker wants medical service available when he is unemployed as well as when he is working. Probably no labor union could match in scope and comprehensiveness some of the successful medical service plans which big industrial units, with a highly laudable welfare and paternal point of view, are giving their workers. However, the fact that it *is being given* and not earned, the fact that it is operated by management and not by labor, *and without any public control*, make labor fearful of what will happen in the event of a depression or personal loss of job.

The present manpower shortage and the sudden premium on previously unwanted men over 40, the acceptance of the physically handicapped or even crippled, explainable as it is, by war conditions, shows such groups of workers that their previous disbarment was arbitrary. They see the threat of postwar unemployment and insecurity looming from the shifting physical standards imposed by management.

It is my belief that workers are willing to accept something less than ideal comprehensive medical service if they are certain it is enduring. If industry gives anything toward a health program, the contribution must be guaranteed, so that it cannot be withdrawn during economic depressions. The individual worker must be certain that he is secure or he will not avail himself of health services which disclose and record his physical deficiencies and defects and brand him a poor insurance risk.

Danger to the health and life of a worker is not more important to him than his earning a living for himself and his family. Therefore the insurance risk to an employer may not make it worthwhile in dollars and cents to employ this type of labor when there is no manpower shortage. The risk of disclosing a physical defect that will prevent employment or throw him out of work will be resented by workers until such time as proper public provision is made for placement or rehabilitation.

This is one reason for the fear shown by labor towards periodic health examinations conducted by management. The payroll tax levy in the ladies garment industry is, in part, acceptance of the risk of industry to pay for health casualties, occupational or non-occupational, among its workers.

After a worker secures health security for himself, protection to an extent which insures him of a livelihood when he is able to work and cash assistance and hospitalization to take care of the problems of illness and the upkeep of his household when he is disabled, he wishes to secure medical care for his family.

It may be that this program of extended medical care is too ambitious to be realized at present. Certainly such objectives cannot be attained through the sums that are being contributed by management in the garment industry to the workers by means of the present payroll tax levy.

Therefore, in the absence of any other acceptable measure, the ladies garment workers want to purchase extended medical services and insurance which will provide:

1. Cash during periods of illness when income has ceased;
2. Hospital cash assistance in payment for part or all of the hospital bill;
3. Cash aid to defray cost of the surgical or other costly medical services:
4. Home visiting nurse service;
5. Tuberculosis sanitarium care;
6. Convalescent home care;
7. Medical service that will keep them at work and of a quality that they have not been able, because of high costs, to secure from individual practitioners; service that will have as its primary function the prevention of disease; service that will permit the surveying of mass groups to discover and treat defects when they are remedial and with the least possible loss of time.

Group and Hospital Insurance Plans

—Role and Future Prospects in Industry—

NEVILLE PILLING,
Chief Executive, Zurich Insurance Companies, Chicago

WE HAVE had a great deal of evidence to demonstrate that there does exist a real need on the part of the average person for some pre-payment plan to care for the cost of surgical expense, hospital expense and perhaps even medical reimbursement. The National Physicians' Committee for the Extension of Medical Service, through Opinion Research Corporation, found that already approximately 22% of the people employed in American industry work for firms which provide a plan for paying the cost of serious illness. This 22% figure, of course, does not embrace all persons who insure against such contingencies or who are otherwise provided for. As a matter of fact it has been determined by the Health and Accident Underwriters' Conference that in 1942 about 30 million people were covered under some form of accident and health insurance. Personally, I do not believe that this number is adequately protected. On the other hand, I am equally sure that, of an estimated 50 million industrial workers in America, the total number who have some form of protection on a pre-payment basis is considerably greater than the approximately 11 million represented by Opinion Research survey.

However we may attempt to gauge the present participation, the fact does remain that an exceedingly large percentage of our people are either relying upon their savings—or hoping to be lucky and escape those every day occurrences which hospitalize so many—or are borrowing money from small loan channels to meet the expense when it arrives finally on the door-step in its usually unexpected manner. Were this not true there could be no basis for the present sincere pressure for legislative intervention by the leaders of organized labor, and there would be much less interest on the part of business managements than there is today in plans to aid employees to make adequate provision against these contingencies.

Our good friends representing labor unquestionably believe that the best interests of the people they represent lie in the passage of a law under which furnishing adequate facilities for hospitalization, surgical and medical attention is compulsory, as is proposed in the

Wagner-Murray-Dingell bill. I believe that the Wagner-Murray-Dingell bill has now served its sole useful purpose. I refer to the fact that this bill has precipitated serious study on the part of business and industrial managements, medicine and surgery and insurance, to the end that a solution through voluntary action may be found.

Admittedly hundreds of thousands of our people do not receive necessary surgical and hospital treatment every year, but I do not believe that this failure to enjoy the treatment and facilities is chargeable solely to monetary reasons or lack of adequate facilities. I do believe that a large percentage of such failure to enjoy these necessary correctives is because of absolute lack of understanding of what to do, how to do it, and why it should be done on the part of the people themselves. Thousands of our people today die from heart disease, cancer, appendicitis, diabetes and many other ills through sheer ignorance of those things which should be done by the ailing individual. Thus I say that one of the prime functions to be served by insurance carriers, the medical profession, industrial managements and leaders of labor is to bring to our people knowledge which will cause them to want to provide for these necessary services. Countless millions of dollars are expended every year by industry, by insurance and now, more and more, by organized labor in the field of occupational injury and industrial disease prevention and control. This represents a rather successful attempt to control a condition which has been well recognized for many years. That these efforts are devoted to a problem which on the average causes a loss of 0.6 day per annum for every employed industrial worker when concurrently these interests take proportionately less heed of the fact that the same worker loses 8.8 days per annum from non-industrial causes, shows that the time is long overdue for insurance carriers, the medical profession, industrial managements and leaders of labor to work more aggressively on the stream from the bunghole through which the greater economic loss takes place instead of concentrating primarily on the drips from the spigot.

In my opinion insurance offers the logical field to spearhead the attack upon this tremendous economic cost and the suffering of individuals and their families by educating those people as a part of our daily activities to their dire need to utilize the services of medicine and our magnificently equipped hospitals.

It appeals to me that any efficiently thinking business management must recognize that it is more important to improve the physical efficiency of its manpower than it is important to improve the mechanical efficiency of its machine power. I say to you that, unless this be done, passage of all the laws that man can conceive, the sale of all the group insurance plans that can possibly be sold or purchased, the development of Blue Cross organizations, the institution of industrial clinics—all of these will produce but a fraction of the benefits which would follow if they were implemented with a thorough A, B, C type of mass education in the simple elements of making people want the things that all of these facilities can furnish.

I could present you with statistics, actuarial figures to the point of boredom but, frankly, these don't appeal to me any more than I think they would appeal to you. I believe the point of this problem is fairly simple one:

1. Organized labor cries out eloquently for passage of laws to make compulsory the furnishing of facilities which will make a better physical nation. There is nothing wrong with the objective. The end is something to which every citizen of this country is entitled. The thing wrong with it is the method—the same fault which governed business management in the early 30's of the depression. They still seem to believe that every ill must be cured by the passage of a law, and I contend that is not true.

2. Business management has its responsibility in this matter because what is good for the individual is good for the nation, and what is good for the nation, is good for business. Today more and more of our industrial leaders recognize this fact and are setting their courses accordingly.

3. The insurance industry either has a place which it can fill, or it hasn't—if it has it must do something about it. If it hasn't it should get out of the matter and leave it entirely in the hands of those concerned. I believe that insurance has a place and a very proper place in this problem, and that it can and will do a great deal about its solution.

4. Organized labor has a very definite place in the problem but, in my judgment, to date organized labor has sought a solution which is incompatible with its own fundamental aims. I believe that the best interests of organized labor lie in the total preservation of the capitalistic system—with the maintenance of the free right of labor to combine and negotiate for its welfare, and with the least amount of necessary legislative intervention. Legislative intervention in the field of insurance as now advocated by labor may well lead to similar intervention in other fields. And I submit further that the problem we are discussing represents one ground where basically there should be no difference of opinion between any of the parties concerned.

WITH the foregoing as a premise may I take a few more minutes to tell you very briefly how group insurance, as one instrument out of many available for meeting the requirements of Mr. and Mrs. America, earns its right to a place in solving this need.

1. Insurance carriers are thoroughly and well equipped to make people want better medical treatment and hospital services, and, unless that desire be created, all the facilities in the world will but poorly answer the need.

2. Under group insurance plans any one able to work, regardless of pre-existing ailments such as heart conditions, nephritis, tuberculosis, etc.

3. Every physical ailment not compensated for under workmen's compensation laws to which human flesh is heir is included under group insurance policies.

4. Group insurance has no age limitations.

5. Administratively it is the isolated case where claim payment is not made by the insurance carrier within 72 hours. Most such claims are actually paid the day the papers are received by the average insurance carrier.

6. The cost of group insurance plans compares most favorably with any other so far advanced method.

May I use for comparison the Wagner-Murray-Dingell bill under which is proposed quite a comprehensive series of benefits. Let us take an employee earning $28.00 per week. Under the Wagner bill he would be entitled to $10.00 weekly during total disability plus $6.00 daily while confined in hospital, plus furnishing of necessary medical and surgical treatment. Hospital, medical and surgical treatment is also provided for the employee's dependents. For these benefits, plus some others which will be referred to later, the Wagner bill proposes to collect by a payroll tax $87.36 per annum from the employee plus a further $87.36 per annum from his employer for a total annual contribution of $174.72 per annum. To furnish the

same benefits under a group insurance policy of my company—and this is true of most group insurance carriers—would require a total cost from the employee or the employer or both of less than $62.00 per annum. Ordinarily group insurance plans do not include payments for ordinary medical expenses of a non-surgical character although these are provided for in the Wagner bill. However, in the above comparison the insurance plan includes medical treatment expense as well as surgical expense. One further point of clarification. The Wagner bill provides also for permanent disability benefits. These have not been included in the group insurance cost just quoted.

The prime significance of this comparison lies in the fact that the principal benefits of the Wagner bill are being duplicated and provided every day under group insurance plans at a small fraction of the cost of this proposed compulsory measure.

It may be interesting to translate the cost into rates on payroll. Let me cite you a specific case. The institution I have in mind employs a good many thousand people. It is proposed to provide benefits which will pay 50% of the average earnings of each employee for lost time. This is limited to $3000 annual earnings for any employee. To this is to be added a $5.00 daily benefit while confined in the hospital plus hospital extras for x-ray, laboratory, etc., of $25.00, plus a surgical operation up to a maximum of $15.00 for a major operation, plus medical reimbursement for ordinary medical treatment either at the patient's home or at the doctor's office. It is proposed to provide for all dependents of these employees' hospital confinement coverage including maternity benefits at $5.00 per day of confinement plus $25.00 for hospital extras. This presents a practical plan for providing for the care of both the employees and dependents. It gives the employees absolute and free choice of doctors, and hospitals. And, mark this well, the cost of the above described plan for this specific case will be 1% of each pay check from the employee and 1% of each pay check from the employer. Thus a total cost of 2% of the payroll will provide benefits which, while not including all phases of the Wagner bill, will nevertheless adequately meet the needs of these employees and their dependents and at a cost of exactly one-sixth of the amount called for by the Wagner bill.

In 1943 about 6,500,000 persons required surgical treatment in the United States.

In 1943, 13,000,000 persons were confined in hospitals for an average stay of 12 days.

And, in 1943, workers in industry lost approximately 400,000,000 production days because of illness and non-compensable injuries.

The burden of this cost cannot be borne by every person affected without some form of pre-payment plan. The need for pre-payment plans does exist.

The national health insurance idea is susceptible of political promotion irrespective of its many and obvious faults.

The best way to avert national health insurance by compulsory means is to make an attractive alternative available for those who want it.

That, Mr. Business Man, is your job and your responsibility if you would avert further heavy and unnecessary tax burdens.

That, Mr. Labor Leader, is your job if you would avert burdensome and unnecessary tax deductions from the pay checks of your union members.

That, Mr. Insurance Man, is your job if you would justify your right to exist and continue in the field of group insurance which you pioneered well over a quarter century ago.

Extended Care

—Under Group Medical and Hospital Insurance Plans—

FRANK P. HAMMOND, M.D.,
Medical Director, Plan for Hospital Care, Chicago

NEARLY 14,000,000 Americans are protected against the costs of hospital care through enrollment in Blue Cross plans sponsored by civic leaders, hospitals, and the medical profession of the United States. These figures include more than 13,000,000 workers and dependents, also 600,000 members of the armed forces under suspended contract who may renew their protection upon return to civilian life. Approximately 1,000,000 of the Blue Cross participants are also enrolled for medical or surgical protection through medical plans sponsored by state or county medical societies.

Definition and Scope of Blue Cross Plans

A BLUE CROSS plan for hospital protection is a nonprofit corporation sponsored by civic leaders, hospitals, and the medical profession of the area in which subscribers are enrolled. The 14,000,000 participants represent over 200,000 employed groups, large and small, urban and rural, industrial, mercantile and professional.

The outstanding characteristic of a Blue Cross plan is the provision of "service-benefits" which are guaranteed through contracts between the plan and the "member-hospitals" in the area in which enrollment occurs. Payments for service are made by the plan directly to the hospitals, and the benefits are expressed in terms of days of care or type of special "services," rather than in terms of "dollars" of indemnification toward bills incurred by the patients.

At the present time, Blue Cross plans are available in 40 states of the Union which contain more than 115,000,000 population. Twenty-four of the 78 approved plans are state-wide. Most Blue Cross plans are under the supervision of the state insurance and welfare departments. Usually the initiation of Blue Cross plans has been made possible through special regulatory legislation sponsored and encouraged by the hospitals and the profession.

Explanation of Rapid Growth

THE rapid development of Blue Cross plans as compared with other forms of voluntary health insurance lies in several characteristics of hospitalization.

The hospitals of America are a public service rather than a private industry. The $3,500,000,000 of capital investment has been provided almost exclusively through taxation or voluntary contributions, without expectation of interest on, or return of, the initial investment. The trustees and administrators of hospitals reserve no profits from the institutions. Their only purpose is to make the hospitals of America, which now provide the best facilities and service in the world, readily accessible to those in need of care.

A hospital bill is unpredictable as to time and amount, it is accompanied by absence from gainful employment, and it usually involves expenditures for other professional services in the home or the hospital. These factors explain why self-supporting Americans have welcomed the opportunity to place hospital care in the family budget along with other necessities.

Blue Cross protection is enjoyed by over 10% of the American population. But the percentage exceeds 20% in Delaware, Rhode Island, Connecticut, Ohio,

District of Columbia, Michigan, and Colorado, and has reached 15% in Pennsylvania, Massachusetts, Minnesota, New York, and New Jersey. In some urban communities the percentage of coverage has exceeded 50% of the eligible population, notably Cleveland, Ohio, Rochester, New York, Rockford, Illinois, and Duluth, Minnesota.

Community Medical Plans

MEDICAL service plans available to the public on a group prepayment basis have been available in America for approximately 20 years. They have long been known in the medical profession as "Contract Practice," and originally such care was provided by groups of physicians who contracted directly with employers, with the employees of a single firm, or with the population of an entire area.

Free-choice medical service plans, sponsored by the entire medical profession of a community began in 1933 in the states of Washington and Oregon. They were extended to California and, more recently, to eastern communities. At the present time there are state-wide medical plans in California, Oregon, Michigan, Massachusetts, Colorado, Pennsylvania, New Jersey, North Carolina, and Delaware. There are also regional plans in operation with headquarters in Kansas City, Buffalo, Utica, and New York City.

The medical and surgical plans are uniformly established to provide "free-choice" among the participating physicians, each of whom signs a contract with the plan to provide service to the contract holders and their dependents in accord with the benefits included in the contract.

All of the plans which have enrolled any substantial number of medical-service subscribers offer merely surgical benefits for hospitalized cases. This has permitted a relatively low subscription rate, approximately the same as charged for hospitalization, and has resulted in a rapid increase in the enrollment of subscribers. Approximately 600,000 of the 1,000,000 participants in free-choice, medical service plans are located in the state of Michigan. Another 100,000 are enrolled in each of the states of California, Oregon and Washington.

Most of the medical service plans have been established under special enabling acts similar in general character to the nature of the regulatory legislation for non-profit hospital service plans.

Approval Program for Blue Cross Plans

ELEVEN years ago the American Hospital Association recognized the value of the insurance principle for lightening the burden for hospital patients and stabilizing the revenue for the institutions. Accordingly, a set of "standards" was developed which should characterize hospital plans if they were to be supported and encouraged by the American Hospital Association, and if hospitals were to be urged to participate in their establishment and promotion. The standards are now used as the basis for formal approval of non-profit hospital service plans. This approval authorizes a hospital plan to identify itself with the seal of the American Hospital Association super-imposed upon a Blue Cross—hence the name "Blue Cross Plan."

Originally the standards were concerned primarily with protecting the public interest and promoting the idea of group pre-payment. It soon developed that members of the general public, particularly employers, also regarded "approval" as evidence of financial stability. Consequently, the Association included in the standards financial provisions consistent with the requirements of the state departments of insurance and public welfare.

Standards of Approval

THE standards for approval of Blue Cross plans may be summarized as follows:

1. There should be adequate representation in the governing body of all important groups in the community concerned with the provision of hospital care, particularly hospital administrators and trustees, the medical profession, and employers and employee groups.
2. Emphasis should be placed upon the welfare of subscriber rather than the financial value of the Blue Cross plan to the member-hospitals.
3. The organization should be non-profit, in fact as well as in legal theory. Private investors should not be permitted to make a profit from the activities of the organization.
4. Benefits should be available in "service" rather than cash, and should be guaranteed to the subscriber through contracts with member-hospitals in the area where enrollment occurs.
5. There should be free choice of hospital and physicians, and all hospitals of standing should be permitted to participate in the activities of the community plan.
6. Blue Cross plans should be financially solvent and should maintain adequate statistics of receipts, payments, and services.
7. Enrollment and public education procedures should be maintained on a dignified basis consistent with the relation of the member-hospitals to the communities which are served.

Scope of Hospital Benefits

BLUE CROSS plans are similar, but not identical, in their hospital benefits to subscribers and dependents. By and large, they provide complete hospital service for three or four weeks per person per year.

Hospital service is defined to include the services available through the member-hospitals, that is, the services which typically appear upon the hospital bill presented to, or payable by, the patient.

One aspect of the standards, not specifically mentioned above, is that Blue Cross plans should not disturb existing relationships among hospitals, patients, and physicians. Accordingly, the Blue Cross plans have taken the position that their primary function is to relieve the patient of the burden of a hospital bill. In no instance have the benefits of the Blue Cross plans been more comprehensive than the services available to the general public through the member-hospitals.

The general rule is for Blue Cross benefits to cover all accidents and illnesses except those covered by state and Federal workmen's compensation laws, or for which a subscriber is legally entitled to free service. Early in the development of the movement, maternity care was available only for employed persons, but now plans provide obstetrical benefits for all members enrolled under family contracts. Likewise, a number of the plans have removed certain original exclusions with respect to nervous and mental cases, tuberculosis, self-inflicted injuries, conditions known to exist, diseases not common to both sexes, etc.

Subscription Rates

SUBSCRIPTION rates for hospital protection are established at levels which are the result of generally known data and actual experience. The early subscription rates were approximately $9.00 per year per

person for benefits in semi-private accommodations. This amount was approximately 1% of the average individual income among the classes using semi-private accommodations. The amount of medical and hospital service received and paid for is affected less by the size of the family than by the amount of family income. Accordingly, Blue Cross plans, operating as public service agencies, have placed primary emphasis upon a reasonable "family subscription rate." Family protection has been provided at proportionately lower rates than service to single employed persons.

Government social insurance carries the principle of family protection to the logical conclusion, by charging each wage earner in proportion to his income, without regard to the individuals dependent upon him. Blue Cross plans have not gone this far in their rate structure, but have established rates with the following characteristics:

(A) Equal charges for employed men and women.

(B) Two-person (husband and wife) contracts at rates about twice the charge for one person.

(C) Family contracts (for three or more persons) at less than three times the subscription rate for the employed member of the family.

There is a general trend toward a two-rate structure of charges, with the "family rate" being the same for two persons as for larger families. The explanation lies in the following facts. First, the proportionate ability to pay is greater in a small family. Second, the *utilization* of two-person contracts (where maternity is included) is as great or greater than for three-person contracts. Third, the administrative expense is reduced. The two-rate structure has met with no public resistance in the places where it has been introduced.

Utilization

ACTUARIAL estimates of utilization were originally based upon the rough-and-ready principle that subscribers would require an average of "one-hospital-day-per-member-year" of protection. This figure was somewhat higher than the average care received throughout the country, but it was assumed that removal of the economic barrier would increase the demand for hospital care.

After 10 years of experience, based upon approximately 25 million member years of protection (exposure), the one-day-per-year allowance has proved more than adequate. In some groups the utilization exceeds the average of one-day-per-member-year, in others it is considerably lower. The following general facts have been demonstrated:

Other things being equal, *women require about 50% more hospitalization than men.* Most of the difference is to be explained by the hospitalization for conditions peculiar to women. The ratio applies to all classifications of subscribers. *Women dependents use considerably less care than employed women.* Women with children use less care than women without them. *Married men use less care* than single men. *Children receive less hospitalization than adults.* "Surprises," actuarially speaking, usually can be traced to enrollment procedures which have created abnormal ratios in the various classes of subscribers, without consequent variations from the "average" amount of care required.

The average length of stay for Blue Cross subscribers is less than for the general public, owing mainly to the fact that Blue Cross subscribers tend to be hospitalized for minor illnesses requiring short stays. The total amount of utilization (when maternity is excluded) is not materially greater than for other members of the population.

There is no evidence that Blue Cross plans have increased the birth rate but they obviously have affected the "selection" among subscribers at the time of enrollment. *Very few people decide to have children because they are members of a Blue Cross plan, but quite a few join a Blue Cross plan because they expect to have children.*

The enrollment of self-employed individuals is a special problem to which Blue Cross executives are now addressing themselves. Group requirements have always been low with Blue Cross plans, extending down to a minimum group of five employed persons. Assuming proper enrollment methods, particularly as to timing, there is no logical reason why smaller groups (four, three, two or even one) cannot be accepted. And, in fact, this policy has been followed in a number of communities such as Massachusetts, Greater New York, New Jersey, Harrisburg (Pennsylvania) and some plans in the West.

Where self-employed persons and their dependents are accepted at irregular intervals, it is customary to place special restrictions on benefits through exclusion of certain illnesses or the imposition of waiting periods, also by charging a slightly higher subscription rate to cover the additional acquisition and administrative expenses.

Continuation and Transfers of Membership

BLUE CROSS plans have adopted two slogans which are socially and administratively important. They are: "Once a Member Always a Member," and "Join This Blue Cross Plan and You Join Them All."

A subscriber and his dependents may continue their coverage after he has left the place of employment where he was enrolled. In some instances the continuing subscription rate is slightly higher than for group protection. The subscriber makes his payments directly to the Blue Cross plan, usually in quarterly or annual amounts. It is estimated that from 30 to 50% of all employees, originally enrolled through groups, continue their membership through "direct payment" when they leave their place of employment. Many subscribers merely transfer from one group to another.

The transfer privilege from one Blue Cross plan to another enables a subscriber to obtain service benefits in the community to which he moves.

Blue Cross Finances

ONE of the requirements of approval by the American Hospital Association is the maintenance of adequate accounting records and sound financial operation and status. Each Blue Cross plan furnishes quarterly financial statements to the Hospital Service Plan Commission in accord with a uniform balance sheet and operating statement. The financial statements are similar to those required by the various departments of insurance, but include more rather than less financial and statistical data.

Approximately 80% of the subscriber's dollar is used for the payment of current hospital bills; another 10% is reserved for the payment of future hospital bills; and the remainder, 10%, is used for acquisition and general administrative expenses. Individual plans vary from these ratios, the tendency being toward lower administrative expenses among the larger firms and those serving metropolitan areas.

As of December 31, 1943, the Blue Cross plan, with 14,000,000 active participants, showed a net earned and unencumbered surplus of approximately $32,000,000. This amount was increased by $7,000,000 during the year 1943 and may be compared with total revenue of $80,000,000 during the entire year. Less than 3%

of the total revenue is used for enrollment expenses, such as salaries and expenses of field representatives, sales promotion material, and general education of the public.

The primary purpose of the Blue Cross plan is to provide as much service as possible to subscribers, and to reimburse the member-hospitals at reasonable rates which will assure a high quality of service during the time the contracts are in effect. Blue Cross administrators and trustees are alert to their responsibilities to the subscribers who provide the funds and to the member-hospitals which provide the service.

Wagner-Murray-Dingell Bill

THE proposed government plan for compulsory medical and hospitalization insurance, pending in the Congress, the Wagner-Murray-Dingell bill, is a far-reaching and drastic extension of the Social Security Act. Should the bill become law, over 110,000,000 people in the United States would be eligible to receive free medical service, free hospitalization, and allied services. They would be given some latitude in the choice of a physician, and the medical practitioners themselves would be reimbursed for their services out of a fund raised by increasing the present social security tax. With some reservations, every gainfully employed person would contribute 6% of his income up to $3,000 each year, and employers would contribute a similar amount. By this means, the Treasury would have in hand the colossal sum of $12,000,000,000 annually with which to finance the elaborate social security program. Of this, approximately $3,000,000,000 would be devoted to medical and hospital care. Administration of the medical and hospitalization fund would be in the hands of the Surgeon General of the U. S. Public Health Service.

The Surgeon General of the U. S. Public Health Service may:

1. Approve or disapprove any physician as a general practitioner or as a specialist under the Act.
2. If the doctor is approved, set a limit on the number of persons he may attend.
3. Fix the fees which he may charge.
4. Fix the rates which participating hospitals, laboratories, etc. may charge.
5. Determine what medical schools or other institutions of learning shall receive Federal money as "Grants-in-Aid" under the Act.
6. Prescribe for the doctor and for all hospitals, laboratories, etc., qualifications above and beyond those required by your state.

In short—and with a conscious effort to avoid exaggeration—it must be said that the Act makes the Surgeon General of the U. S. Public Health Service the sole trustee and absolute dictator of the nation's health. He has virtually unlimited power to make rules having the force of law, and he controls the expenditure of an estimated $3,000,000,000 annually.

If such a system were to become a law, the physician would be obliged either to resign himself to virtually the status of a hired Federal employee, or give up the practice of medicine. To think that he could remain aloof from the operation of that system for any appreciable length of time is to ignore the tremendous economic pressure which such a system would exert on the medical profession as a whole. To subscribe to the adoption of such a plan—or passively to acquiesce therein—is to admit that medical service in this country, although it is the best the world has ever known, is a complete failure, and that a government bureau can better safeguard the health of the nation, than can a system of private medicine.

With $3,000,000,000 a year, the Surgeon General could hire every physician in the United States at an average salary of $5,000 a year; rent every bed in every non-government-owned hospital throughout the entire year at a cost of $5.00 per day; pay $2.50 per day for every bed in every government-owned hospital for 365 days each year; and purchase $168,000,000 worth of drugs and medicines. There would then be left over the sum of $600,000,000 for administration costs, which would take care of a vast army of office workers and also leave a substantial sum on hand for "deserving" politicians.

A few figures taken from a recent survey by Opinion Research Corporation, Princeton, New Jersey, sponsored by the National Physicians Committee for the Extension of Medical care, are illuminating in connection with compulsory medical care and hospitalization insurance:

Only 16% of all the people favor a 6% payroll deduction from wages for the Federal government to provide medical and hospitalization insurance.

63% felt something could be done to make it easier for people to pay doctor and hospital bills.

63% opposed control of the medical profession by the national government.

55% favor plans with monthly installment payments to take care of future doctor and hospital bills.

Not only would state medicine completely change the present methods of medical practice, but it would also introduce a political angle into one of the most honored professions.

If this scheme were to become a law, what is to prevent a similar idea becoming effective regarding business institutions, industrial concerns, housing construction, utilities; with the legal profession; with the clergy; and with every other public service the people need. And what would become of presently operated hospitalization and medical service plans which are being sponsored so effectively by certain industrial organizations, independent groups, commercial insurance companies, and Blue Cross, on a purely voluntary basis?

The rapid growth of voluntary hospital care protection has been a factor in the timing of suggestions that hospitalization and medical benefits be included in the provisions of the Social Security Act. The motives and objectives of Blue Cross and hospital administrators and trustees are as broad and comprehensive as those which underlie a movement toward compulsory health insurance. The question is merely whether a voluntary solution to the problem of providing health service can be achieved soon enough and effectively enough to meet the demands of the American people.

Money is not the sole factor in the distribution of good health service, and insurance against the hazards of sickness costs will not, of itself, maintain the level of public health which we all desire. Blue Cross and hospital administrators and trustees recommend that the United States Congress and Federal agencies give every possible encouragement to the development of voluntary hospital and medical insurance, also that they extend existing social security benefits to the entire population before including new benefits for those already protected. With government assistance in programs of prevention, hospital construction, and care of public assistance beneficiaries, voluntary plans will be able to concentrate upon protection against castastrophic illness among the employed workers and their dependents. Blue Cross plans are an example and a pattern for a rational and permanent program of financing adequate hospital and medical care.

Voluntary hospitalization and private medical prac-

tice are threatened by the Wagner-Murray-Dingell bill proposed for Congressional action. Nation-wide vigorous promotion of voluntary hospitalization service benefits, including voluntary surgical indemnity coverage by cooperative action of hospital management and the medical profession, appears to be a most vital implement to forestall affirmative legislative action. Most Americans, I believe, have a strong desire to maintain their self-respect by voluntarily paying their way, if a system is devised through which they can budget their hospital and surgical expenses. The medical profession and hospitals are adequately implemented to make such provisions if an amicable and cooperative working basis is established.

Conclusion

BLUE CROSS plans are unique in the history of America and the world. They are a form of public service without public compulsion, an example of private initiative without private gain. They combine the American practice of personal action with a sense of social responsibility.

Health service is a personal service, which requires active and intelligent participation by those who receive it as well as those who furnish it. Blue Cross plans provide this opportunity of voluntary participation, and, with the proper support and understanding, they will go far to distribute adequate care to the American people.

[NOTE: At the conference of the United States Chamber of Commerce on the subject of Social Security, held in Washington, D. C., January, 1944, C. Rufus Rorem, Ph.D., C.P.A., Director Hospital Service Plan Commission of the American Hospital Association, presented a paper embodying the objective and scope of the Hospital Service plan movement, generally known as the Blue Cross plans. Much of the material in connection with the part of this presentation related to Blue Cross plans is taken from Rorem's reprint.]

How Far Should the Employer Go?

HUGH H. C. WEED,
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Carter Carburetor Company,
St. Louis

I HAVE been very much moved by what I have heard. The reason there are so many "isms" going around this country, like the bill we have been talking about, is that so many people have failed in their obligation to make for their employees a place that it is worth while to stay in. I think I was born cross-wise in bed because I think differently from most people about a lot of things.

I am going to talk very frankly about some things today because I think that, if I don't, what I say is not going to be really convincing. You are not going to believe some of what I tell you, but I am going to tell it to you anyway.

There is no reason at all why a place in which you work should not be as happy and as congenial as your home. There is also no reason, and I can prove it, why you can't get the lowest cost in the ultimate product by paying the highest wages.

I am connected with a concern in which I have no interest whatever financially, though I have a large sentimental interest. This concern pays its salesmen, for example, from four to five times as much as other men in the same class of business get. It pays its employees the highest rate in the area. It pays its supervisors from three to five times what they can get elsewhere. In competition with 30 or 40 other people making the same government products, its costs are by far the lowest in the United States.

Now, that is the kind of background that you should have, and that is the kind of background that this concern has, in relation to the problems which you have before you.

I heard with much interest what Dr. Price had to say about the unions worrying because they couldn't be sure of the motive of the employer. Well, they are not going to be sure of the motive of the employer if he changes his motive when they drive up. But if, over a period of many years, the employer's policy has been such that his people are treated as I have described in this concern, the unions have a hard time quarreling with what they do.

In connection with this concern, I am going to tell you what they have done in relation to insurance, medical service, and the like.

Of course, the No. 1 thing in any employer's mind is to make his place a safe place to work as well as a congenial place to work. If he does so, he can't afford to hire insurance to take care of it because liability insurance, while it is well done, must take care of the fellow plant that isn't well organized, that doesn't have safety. It has to be a composite cross-section.

This concern has carried its own insurance for 12 or 15 years and has set aside a reserve of what it would have paid if it had had liability or compensation insurance. The reserve is equal to half of what they would have paid. In this case it amounts to something like $90,000.

The reason it did that was not because it saved money; the reason was so that in the program of keeping the place a good place to work, there could be in relation to the people who were injured or were sick in the plant an attitude much broader than a commercial insurance company could have. After all, it is a dollars and cents proposition with the employees, whereas it isn't a dollars and cents proposition with the employer. If it cost the employer twice as much as he would pay the insurance company, he still would be ahead because he then has control of his relations with his people when they are in trouble.

In this concern, the group insurance, which now totals something like 11 million dollars with about 2,000 participants, costs 27 cents per month per thousand. The man who has $5,000 or more earnings is entitled to $13,000 insurance. The man with an income of $2,500 is entitled to a proportionate amount.

DR. PRICE gave a very interesting discussion of the scheme which the Garment Workers' Union has had for compensation. Let me say that if they have been there for 31 years, they deserve a great deal of credit for having been there early. However, and I would like Dr. Price to correct me if my figures are wrong, they paid $420 a year for $7.00 per week benefit. In this concern I am talking about they have a scheme which they call a Guild; it is a social organization. Outside of all the other things that this company does, this Guild pays $6.00 a week benefit, and it doesn't cost anybody anything. It doesn't cost the Guild anything; it doesn't cost the company anything; it doesn't cost the employee anything.

How do they do it? The company set up a series of vending machines in the plant and it said to the man who put them in. "You can't put them in unless you give the Guild a certain percentage on whatever they sell." Then a lunch counter was set up to sell its products, the best, at less than they cost at the numerous restaurants around the corner. The profits, if any, go to the Guild.

The profits go to the Guild, and what happens? Well, the Guild gives this benefit, which is almost equal to Dr. Price's, and it gives it for nothing. It bought a grand piano the other day. It buys all the uniforms for the teams, and it still has $25,000 in the bank.

I am saying that because if an employer will go at this thing right, he can trim the Wagner bill or the insurance company or anybody else in what he can do for his employees. It is as simple as can be, and the fellows who do the vending like it fine because inasmuch as the profits go to the guild, the boys put nickels in the machine instead of slugs.

That is something that the company sponsors and backs just as it does a small loan company, which is operated by the employees, but which asks 12% instead of 36%, which is the legal rate for small loans in Missouri.

This company gave vacations with pay to hourly-rated workers long before the unions got up to the idea. It has an arrangement by which it carries its monthly men and women and its weekly men and women at full salary up to a stated time if they are ill for any cause whatever.

Just so you may know what those items amount to, the monthly-rated people are entitled to full pay for a half month, half pay for one month, if they have been employees for less than two years; from two to five years, one month full pay, two months half pay; from five to 10 years, two months full pay, three months half pay; 10 to 15 years, three months full pay, four months half pay; 15 to 20 years, six months full pay, six months half pay; and from 20 to 25 years, nine months full pay, three months half pay; 25 years and over, at least one year. The hourly and piece-work rated people are carried for one week at the company's expense at rates which start at $3.00 and run to $4.00 a day, depending on length of service.

Now, this company that I am talking about does not believe in pre-employment examination and, I wouldn't say it doesn't believe in, but it never has had, periodical examinations. Having watched this company's operation for 31 years, I will say to you that without pre-medical examination in 31 years there never has been but one case that I know of in which we feel that a medical examination would change the complexion of the situation.

We have as fine a group of nurses, I think, as anybody has any place. We have an excellent clinic, and the head nurse has final authority as to whether anybody stays at work or goes to a doctor. If a person comes in with a bad cold and she thinks that person is going to spread that cold to other people, she tells the factory manager he has to go home—and he has to go home.

This head nurse spends most of her time in contact with the families of the employees. I heard one word used here today that always gripes me, and that is the word paternalism. If a company is paternalistic, if it thinks it is a Lady Bountiful, everybody knows it. You can't hide it for 10 minutes, and everybody in the plant discounts everything the management does. If the interest of management is not with the men in the shop, if it doesn't have as its ideal to make that place the best place to work there is in the country, then most of what else it does is unimportant.

Now, as I say, this company has no pre-employment examination. It has no doctor in the plant. I am sure that its health record is equal to any. I will challenge anybody in the United States to do better. Its record of injuries, that is, its safety record, is also fine.

I give you that background because we just don't believe in extended industrial health service. I can tell you why in two sentences. I, myself, want to pick my own church; my own doctor; and my own lawyer; and I believe everybody else does, too—except a few misguided souls who have been just the "gimme" boys who want something for nothing without doing any thinking.

Of course, really we don't get something for nothing, because it always costs, even though it is hidden, anywhere from three to 10 times what we would pay the other way. It may be a good salesman would talk me out of that position, but let him try to talk my wife out of it! Let him try to talk my wife into sending her children to some doctor that somebody tells her to. That is why I think industrial health service is a dead duck.

In other words, to put it in one sentence, our belief is that you should pay your employees enough so that they can buy their own professional help or any other kind of help they want. I believe that the citizens of the United States as a whole are self respecting men, independent thinking men and women who want to run their own show.

Medical Service and the Medical Profession

—Future Status in the Light of the Present Socialistic Trend—

ROLAND M. KLEMME, M.D.,
St. Louis

I AM GOING to take the privilege of digressing for a minute from the subject on which I am supposed to speak to make a few comments on some of the things that have been mentioned by the members of the panel so that we may be able to precipitate more of a discussion.

One of the most outstanding features, up to my appearance on this program, has been very forcibly impressed on me, that the speakers and their subjects are dealing exclusively with economics first, and secondly with the social problem, and then they deign to consider the professional problem from the standpoint of medical and hospital care—an attitude that I, frankly, definitely resent.

The problem, up to my appearance here, has been the cost of medical care. Many revolutionary ideas have been propounded, such as the Wagner bill—not here necessarily, but they have been mentioned here. It reminds me to some extent of the history of the revolutionary idea, dating back from the time of Blanqui, prior to the French revolution, up through Haegel, Carl Marx, Lenin, Trotsky, and Joe Stalin.

Now, it is very interesting to me, ladies and gentlemen, that people with broad revolutionary ideas, who make all sorts of promises like many of our politicians, forget those promises as soon as they gain power, and then they exploit the same people to whom they made the promises—better ways of living, better medical care, and what have you.

I am inclined to think, after listening to the panel discussion, that one of the warnings I would like to hand out is "Beware of the bureaucrat" whether he be the industrialist, the insurance carrier, or a governmental agency. As soon as he attains the power he desires, the members of my profession will be exploited and enslaved. There is no question about it in my mind.

We have been rather smug with our position as a professional group in these United States. We have been self-effacing; we have been retiring; and we have contributed a tremendous amount to the industrialization of this country and also of the world.

Does the profession get much credit for it? I am inclined to think they do not. Let's cite some specific instances.

The industrialist, the engineer, the capitalist, point with pride, for example, to the construction of the Panama Canal. The French engineer didn't fail to construct the Panama Canal because of his inability to be an engineer. The construction of the Panama Canal was made possible by medicine—sanitation, preventive medicine. We enjoy bananas on our tables because of preventive medicine. We have been riding on natural crude rubber up until this present war because of preventive medicine.

The industrial physician and surgeon's contribution to medicine in the line of prevention is one of the greatest contributions in the history of medicine. The new alloys that are being concocted could never be carried to maturity but for the industrial physician and surgeon. Many of the diseases that are concurrent with new developments are not only investigated by methods of research, but also overcome by the members of our profession, to make it possible for the industrial giant to carry on.

Our position in this world of social-economic upheaval is conservation of manpower. We have done such a splendid job that everything is taken for granted. We have practically doubled the span of life in three generations.

The same men that held Pasteur in scorn and scoffed at him are now trying to get power to enslave your profession and my profession; we must not overlook that.

The effect of conservation of manpower in industry is not appreciated for only one reason: it doesn't appear on the ledger sheet in the office as saleable goods.

Now, if we must make it appear, let's do it. But let's stop this being pushed around. I don't like it.

One of our speakers mentioned a fee schedule this afternoon. I will grant you that all insurance companies deny there are fee schedules, but everyone works on one; and the fee schedule is made up by lay people who try to evaluate the services of a professional man when they don't even know what the professional man is doing.

I am faced with that situation every day in the year. I resent it; and I think all of us as professional men should resent it. There is no man better qualified to evaluate the value of his services than the man who gives them.

MR. PILLING brought out a very pertinent fact. It is, that the Wagner bill at least has precipitated the discussion of this problem for which this panel is here this afternoon. I think that was an excellent way of stating exactly what the Wagner bill has done to the profession in the United States.

But I think it is a bit sad that politicians, social groups, labor unions, industrialists, and what have you, are trying to foist the Wagner bill on to the American public when between 40 and 60% of the profession that is going to be affected are not even here to protect themselves. They are in the armed service, and I think that is pretty rotten. Excuse me for using the expression, but I think it is unpatriotic. I am just giving you my impressions.

Now to get to my subject—the future status of medicine.

When we look back over a period of centuries we find that medicine was bombarded with all sorts of artifices and complaints and weird suggestions due primarily to superstition and ignorance. These have been partially overcome.

In addition to the ignorance and superstition of the past, medicine is now being bombarded by social-economic trends. The two most comprehensive are the Beveridge plan of England and the Wagner bill of the United States. I am not going to go over what these plans signify because it has been covered very excellently by former speakers.

The one thing that was not emphasized to my own satisfaction was that the Beveridge plan brought out, and you can look it up if you have any doubts, that medicine should be completely and absolutely divorced from politics. It is too bad that wasn't the first premise of the Wagner bill.

It seems to me, looking at this subject philosophically, that we are dealing not only with the social-economic trends, but with the ethical trend, and, even more fundamental than that, we are discussing the potentialities of whether or not the individual exists for the state or the state exists for the individual. I think that is a very fundamental philosophical thought that we must take into consideration, irrespective of the type of social-economic plan that that may create.

It was brought out very forcibly by MR. WEED that he still wants to exercise the privilege of choosing his own church, his own doctor, his own lawyer. That expressed it most tersely and forcefully.

Are we going to disrupt the social professional contact between the patient and the doctor by injecting a third person, whether it be the industrial bureaucrat, insurance bureaucrat, or government bureaucrat, in our relations to our patients; or are we going to continue to treat our patients as personal ethical responsibilities?

That is the whole story in a nutshell on the basis of the fundamental of state for the individual or the individual for the state. That is your problem.

There is nobody who will deny that we need some type of insurance. As MR. PILLING brought out, he agrees with that, and so do I; but he is opposed to the method, and so am I.

If they are going to permit bureaucratic dictatorial policies to affect the practice of medicine in the United States, one of two things is going to happen: either the medical profession will become enslaved or the policy will not succeed.

I read with a great deal of interest some of the ideas as proposed by the Oregon plan, the Rhode Island plan, and several others that were mentioned here this afternoon. I think the whole business resolves itself into one thing: that the medical profession has been asleep. It is unfortunate that I have to admit this, but I think I am forced to.

But let's not forget the ethical side of medicine, the art and science of medicine, at the expense of social-economic security. I think these can all be evolved into a sensible program that will be beneficial to all members of the public, all members of the employee class—and let's hope that it can be extended to members of the employer class.

The time here will not permit me to develop another side of this subject that I would like very much to do, because certainly lots of you want to ask questions. But if the trend of the past 10 years, is of any significance—and remember that the trend may change tomorrow—some form of socialization of medicine is bound to come unless you and I and all the rest of the members of our profession educate the public into the realization of the fact that they are not really getting what they want.

There are several fundamentals that are absolutely essential: free choice of physician; free choice of hospital, in any plan that may be devised.

If, on the other hand, the social-economic trend is

along the line that the state exists for the individual, we will have a modification of our present plan to the satisfaction of all the members of our profession. It is up to us to choose, not on social-economic grounds necessarily, but on ethical grounds and philosophical grounds, whether we want to be a member of one state or another; in other words, a socialistic state or our present capitalistic system.

Discussion

CHAIRMAN NEWQUIST: One question comes to my mind. Mr. Weed mentioned that they do not use physicians to supervise their health program, and that they also do not believe in pre-employment physical examinations. I am wondering if raw material that is brought into the plant is brought in without examination or inspection, or doesn't it have to come up to certain standards to insure the kind of product that goes out at the other end? In my opinion that is what we are using the pre-employment physical examination for. It is a benefit to the worker and a channeling procedure to put him into the job for which he is best suited. If it is not sound from an engineering standpoint to take in raw material without inspection and certain standards, we should certainly have certain preventive measures in force in our plant to protect our new workers and our old workers. How about that, Mr. Weed?

MR. WEED: The answer to that is that, generally speaking, a practical commonsense looking over of a man or woman who comes for employment without any physical examination has resulted in our experience in just as good a total picture as people who have been using the examination. All I can say is that it implies that the examinations that are made by the medical profession are not very effective. I know half a dozen fellows who run plants who have careful examinations, and they have twice as many hernias as we do. I don't know why, but that is so.

CHAIRMAN NEWQUIST: If you don't speak up now, you are in agreement. I am sure that some of you must have some questions.

DR. JAMES M. CARLISLE (Merck & Co., Rahway, New Jersey): I should like to ask Mr. Weed, what is the incidence of early active tuberculosis in the male and female employees of your company within the ages of 18 to 38? How does your management justify employing these individuals with early active tuberculosis and placing them at a station where your son or daughter may be working, when the greatest chance of rehabilitation of that individual rests in placing him in a sanitarium at the time he is actually working for you? A second question, and the other extreme, how does your man working in your social club view your allowing an employee of substandard health being placed in work that brings him in contact with healthy individuals or that will accentuate a disease which the employee may not know existed?

MR. WEED: A few cases of tuberculosis have developed in our history. That is a matter that touches me very deeply because my own son has been a victim of tuberculosis and has been cured.

You are asking me for statistics that I do not have at hand, but from my memory I would say that we have probably not had over 10 cases of tuberculosis among a group running from 400 to 3,200 over a period of years; that is, active enough so that they appeared and later were hospitalized. I don't know how that compares with the average group that you know about. Your statistics would be better than mine, but I would imagine it is rather low.

As to the other employees, nobody has ever raised a question and nobody has ever complained. The only case that has ever been complained about in our plant by other employees was this: We had a girl in the office who got married, and her husband had syphilis, so pretty soon she had a case of active syphilis. She had been there many years and was an innocent victim, but some of the employees objected to it. We saw that she was taken care of so that she was not a menace to anybody else, but we did not discharge her.

DR. JAMES VALENTINE (Chicago): I enjoyed Mr. Weed's talk very much. He made a statement that I can't resist asking him to elaborate on a little. I would like to know from a layman's standpoint, having practiced medicine 32 years myself, how he diagnoses a case of albuminuria by looking the individual in the eye, or a case of diabetes by the smile on a man's face, or syphilis from the glint in his expression, etc.

MR. WEED: Doctor, I don't diagnose anything. But, while our nurses are not doctors, they are pretty smart girls and they have been at this thing a long time. If they have the slightest suspicion of anything about anybody, they get him over to a doctor right quick. I don't mean that we don't use doctors. I merely mean we don't use a pre-placement examination. We use lots of doctors, and pay the regular fee for the job they do, but we don't do it by pre-placement or periodic examinations of everybody. We may miss somebody, but if you want to go into it, you pick the best record you can and check it against ours.

DR. WM. G. WOOD (National Lead Co., St. Louis): It may be a personal question, but I am wondering why you do not have the preliminary examinations?

MR. WEED: I will tell you why. It is very simple. It is the pure labor of going through it. In the last five months we have employed 3,000 people to get 800, and I don't know how we would ever get it done.

DR. MOORE (Chicago): One way you could do it is to have pre-employment examinations. That would not take any more time than it does the way you hire them. Mr. Weed made the statement that he wanted to pick his own doctor. Well, he spends lots of money on his employees. I believe if he would let his employees see a doctor, and not a nurse, they would be getting the medical attention they deserve.

MR. WEED: We do send them to a doctor. If a person comes in with a fever, the nurse tells him to go see his doctor—not our doctor, but his doctor.

DR. MOORE: But she doesn't know whether the man has a heart condition so that he shouldn't do heavy lifting or heavy labor, which a doctor would find out. If you had pre-employment examinations, your doctor would eliminate these 2,200 people that you turned over on the list.

MR. WEED: He wouldn't eliminate them. They were not turned over for medical reasons; they didn't want to work. They only stayed a week. That is the trouble we are having now.

DR. HAMLET C. PULLEY (Los Angeles): With regard to the particular industry under discussion, I have this thought: While that industry might be able to select its men carefully by offering a wage scale way in advance of others in competition, that could not be applied generally. People have to work and companies have to have workers, so possibly they couldn't all be as selective.

Another point was brought out in the conference that I think deserves emphasis. In my work in public health, I have had the experience that in many cases preventive measures have to be forced on people to some extent in order for them to be put across. People don't like to be vaccinated when they are well. They will go to a doctor when they are sick.

A thought has been advanced here that I think deserves restating. In any place where large groups of employees are brought together, we have a good opportunity of doing public health work, preventive work, that we should take advantage of wherever possible.

MR. WEED: I must take issue with you on one thing. You say everybody isn't able to do that. That is where you are wrong. We have no monopoly on paying high wages; anybody can do it. You know why it works? Because nobody has yet found out how much a lot of fellows who want to work together can get out. There is no limit to team work. That is the point I am bringing out. Anybody can do it. There is no trick to it.

DR. KINGSLEY ROBERTS (New York): It has been my privilege in the last five or six years in wandering around the social-medical field to talk to labor leaders. One thing I am convinced of is that whether the Wagner-

Murray bill passes or does not pass—and personally, I don't think it has a Chinaman's chance—the question will recur. It will recur whether a Republican administration succeeds or a Democratic administration repeats.

It is up to us as physicians to stop this Hatfield-McCoy technique, and to see if we can't find a common ground on which we can sit down with labor representatives, if you will, so that our mutual problem can reach a solution. Just saying "It ain't so" is not going to solve anything, but if we try to find a mutual ground, we may get somewhere.

Industrial Medicine: Public Health: Radiology

—Abstracts of Industrial Medical Papers presented at the Meetings of the A.M.A. Section on Preventive and Industrial Medicine and Public Health, and the A.M.A. Section on Radiology, June 14-16, 1944, Chicago—

Reported by

C. O. SAPPINGTON, M.D., Dr.P.H.

THE section meetings above named included material on health education, psychological management of employee problems, physical fitness, disease of the lungs, variations in industrial medical service plans, attitudes on and results of mass x-ray surveys, and benign pneumoconiosis.

Particularly interesting among the exhibits of the Section on Preventive and Industrial Medicine and Public Health were those of DRS. SANDER and ENZER, on Pulmonary Siderosis of Welders; DRS. VAN ORDSTRAND, DENARDI and CARMODY, on Industrial Diseases in the Beryllium Industry; DR. TOWNSEND, on Industrial Hygiene Services in War Industries; DR. SAYERS and SCHRENK, on Hygiene of Dust in Air; DR. E. G. MEITER, on Occupational Disease Hazards —Detection and Control; DRS. CARLISLE, REILLY and MARTLAND, on Industrial, Civil and War Injuries; DRS. KEHOE, TREON, CRUTCHFIELD and KITZMILLER, on Toxicology of Some Alicyclic Compounds; and DR. DURHAM, on Newer Methods in Aerobiology as Applied to Allergy.

A special exhibit on Rehabilitation was also of great interest to industrial men, including the subjects of fractures, amputations, lame backs, hearing, tuberculosis, heart disease, psychiatry, community relations, and reemployment, as demonstrated respectively by DRS. SPEED, KESSLER, OBER, GROVE, GARDNER, STROUD, STEVENSON, VONACHEN, and BURNELL.

Excellent motion picture exhibits formed a part of the convention on a wide variety of technical subjects with reference both to diagnosis and treatment, as well as rehabilitation; and there were also the excellent training films from the Bureau of Medicine and Surgery of the Navy and the Medical Department of the Army. Of the latter, particularly interesting were the films on protection against the common war gases and the use of gas masks; and first aid for battle injuries, for non-battle injuries and for chemical casualties.

THE Section on Preventive and Industrial Medicine and Public Health voted to make a change in the order of the papers as scheduled on the printed program.

DR. L. E. HIMLER discussed "Psychologic Technics in the Management of Employee Problems," changing his title from the one originally planned.

The placement and management of industrial employees does not demand new technics as much as it does a more effective application of the tools already at the disposal of the industrial physician. Full use of the case history approach—apperceiving and interpreting the drives, motivations, complexes, maturity and solidarity of personality —is especially necessary when the neuropsychiatric aspect constitutes all or a significant part of the disability. Therapy in such instances must be concerned as much with sociological as with the physical and mechanical forces shaping and giving direction to the employee's industrial adjustment.

Most technics are too cumbersome, and one, to be practical, must be brief as well as readily applicable. Patience and a sympathetic interest are primary prerequisites. One must apply the same principles as in the study of tissue pathology. It is usually possible to single out predominant symptoms for the approach.

An outline was made on 40 unselected cases with respect to the various attributes and factors concerned, among which were employment instability; inferiority; egocentricity; inadequate response; marital troubles; insecurity; alcoholism; poor attendance; personal economics; schizophrenia; and spceial fears.

In reviewing methods for the use of the industrial physician, Levine has listed 30, only five of which require special knowledge. DR. HIMLER believed that there were 27 procedures that could be used, and placed emphasis upon physical examination, physical therapy, laboratory tests, guidance, reassurance, the ignoring of symptoms and a balanced routine, attention to personal health, suggestive therapy, social living, listening-posts, outlets for fears, frustration outlets, the lessening of environmental strain, consideration of new occupations and environments, cooperative attitude of supervisors, leave of absence, vacations, and desensitization. Special emphasis was placed on specific adaptation to individuals, and a simplification of the technic, as with neurotics and children.

Using these methods on various groups, there has been a good response in 45%, a fair response in 38%, and in 17% the response could be said to have been negative.

It is important to remember that there is also a responsibility placed upon the physician in the teaching of various environmental personnel, including foremen, superintendents, and nurses.

MR. W. P. JACOBS (Chairman of the Committee on Physical Fitness in Industry of the War Manpower Commission) presented the subject "Physical Fitness in Industry."

The need for improved physical fitness among the civilian population has been attested from every walk of life. To bring about improved physical fitness among the civilian population is the concern of all. This objective is the major goal of preventive medicine in all its phases. Certainly a standard of physical fitness for civilians higher than that which characterized our nation prior to the war is imperative. Approaches to the problem include development of a personal responsibility for physical fitness, proper assumption of responsibility and cooperative planning by labor and management, availability of

Wednesday, June 14

COMMUNITY Health Education by the Medical Profession" (lantern demonstration)—BRUNO GEBHARD, Cleveland.

Discussion opened by W. W. BAUER, Chicago.

"Psychologic Technics in the Employment of Disabled Exserviceman"—L. E. HIMLER, Ann Arbor, Michigan.

Discussion opened by HAROLD A. VONACHEN, Peoria, Illinois.

"Physical Fitness in Industry"—W. P. JACOBS, Clinton, South Carolina.

Discussion opened by W. A. SAWYER, Rochester, New York.

"Bagasse Disease of the Lungs" (lantern demonstration)—W. A. SODEMAN and R. L. PULLEN, New Orleans.

Discussion opened by JOHN H. MUSSER, New Orleans.

Chairman's Address: "Relocating of Physicians as Prerequisite to Better Medical Service" (lantern demonstration)—JOSEPH W. MOUNTIN, U. S. P. H. S.

Thursday, June 15

PANEL Discussion on Variations in Industrial Medical Service Plans (lantern demonstration).

Essayists: JOHN J. WITTMER, New York; SIDNEY R. GARFIELD, Oakland, California; EDWARD M. JONES, Johnson City, New York; JAMES M. ADAMS, New York; M. S. BLOOM, Binghamton, New York; JAMES C. MCCANN, Worcester, Massachusetts.

Thursday, June 15, 2:00 P.M.

SECTION ON RADIOLOGY: "Industry's Attitude Toward X-Ray, Examination of the Chest" (lantern demonstration)—C. D. SELBY, Detroit.

Discussion opened by COL. A. J. LANZA, M.C., U. S. Army.

"Benign Pneumoconiosis" (lantern demonstration)—EUGENE P. PENDERGRASS and SIMON S. LEOPOLD, Philadelphia.

Discussion opened by COL. A. J. LANZA, M.C., U. S. Army.

"An Analysis of Disqualifying Conditions Found During the Chest X-Ray Examination of 105,141 Selectees (lantern demonstration) —MAJOR RICHARD E. KINZER, M.C., U. S. Army.

Discussion opened by C. C. BIRKELO, Detroit.

fullest use of technical expertness available in the American Medical Association, cooperation of medical directors in industries and of medicine generally in promoting industrial physical fitness programs and impressing management with the importance of physical fitness, fullest use of expert leadership in the fields of physical education, health instruction and recreation, and fullest development of responsibility and cooperative planning on the part of the public and private resources of communities.

Physical fitness was briefly defined as a condition with a minimum amount of disability, permitting adequate performance of tasks, rapid recovery from fatigue, the ability of self-discipline, and inner regulation.

The war experience provides an opportunity for industry to train one million of the two million men rejected.

The movement has been of slow growth; so far there has been too much preaching and assignment to others. The result has been that most individuals doubt their ability to change their habits and reactions, and so nature takes its course.

Any such program should be under the immediate direction of the medical profession, for without them there is no probability of success. The problem is strictly an individual one with regard to different persons, and the requirements vary greatly.

Systematic planning is necessary for success. There must be a critical analysis of possibilities, habits, environment, adjustment groups, sex, management, labor, and community. The secret of success lies in the education of the individual, who must be convinced of the necessity of physical fitness for his own progress. Therefore, there must be a correct diagnosis of individual needs. There is, moreover, a vital need for individual participation, and stress must be placed on the competitive spirit.

The program can be but a vehicle of the factors which lead to success; the larger industries have made considerable progress. The program, moreover, involves all phases of human life.

This is a very signal opportunity for the medical profession, and great dependence must be placed on the profession; industry should pay the bill, and is paying it in some instances; the government is able to assist and is assisting; the medical profession can now sanction this movement and be a vital factor in its success.

DR. W. A. SAWYER, in opening the discussion, stated that this was a note needing sounding on a large scale. There is now a critical manpower situation. Industry has had similar programs, but never continuous or on a large basis. A new leadership and active crusading spirit are now imperative.

COL. LEONARD ROWNTREE believed that MR. JACOBS was the spearhead of this movement. The real problem is individual application in the community, similar to the way the military has proceeded. The movement calls for education and medical leadership, which will come, and necessitates new emphasis on health counseling, needing a new approach within the profession. This is a cooperative undertaking.

DR. CARL A. WILZBACH questioned whether the medical profession now sees this problem as it really is—probably the profession is not as alive to the situation as the Army has been. A report will be given in another meeting of this section detailing an experience with medical and dental examinations of 6000 high school boys and girls as a part of the Victory Corps program. It is extremely important that the medical profession should lend its active and full support to a nationwide physical fitness program.

DR. KINGSLEY ROBERTS thought that the expression should be "practice *with* and not on people." Education is the vital factor. There are now elements in the labor-management health program which can be applied. Moreover, there is a distinct demand for increased non-industrial and industrial medical care.

DR. IRVING GRAY cited the experience of the founding of the Brooklyn Health Center and the work of Dr. Landes. Here labor, management, and the county medical society cooperate in a fitness program which starts in childhood. If this project and other similar ones are done well, the problem of national physical fitness will be easier to solve.

DR. MORRIS RASKIN stressed the necessity of bringing recreational facilities to the worker and a sincere consideration of the interests of those concerned, the workers.

DR. RUFUS CRAIN closed the discussion, emphasizing the necessity of gathering loose ends in the technic of the industrial physical examination, and cooperation with other educational groups, with the best use of community facilities.

DR. R. L. PULLEN presented a paper on "Bagasse Disease of the Lungs."

Bagasse is a product remaining after extraction of sugar from sugar cane. Its use in the manufacture of acoustic board has resulted in inhalation of dust with the development of a clinical picture characterized by cough and intense dyspnea, occasional hemoptysis and cyanosis, and night sweats, chills and fever. Physical findings are minimal, but the roentgen ray discloses an extensive miliary mottling. Sputum is scant and mucoid. Blood leukocytosis develops with a shift to the left, and, at times, polycythemia is seen. The entire picture clears up in a period of three to four months. Investigation of the cause of this condition has not supported the theories of infection and allergy previously put forward. Biopsy has disclosed bagasse particles in the lung tissue with a surrounding reaction interpreted as an organic type of pneumoconiosis.

This report was based on an analysis of 11 cases characterized by the above findings. The x-ray evidence seemed all out of proportion to the clinical effects. Bronchoscopic examination yielded no definite findings. There was no tendency to tuberculosis or to any tuberculous findings either clinically or by laboratory methods. The sedimentation rate was definitely up in all instances. Treatment consisted of rest in bed, palliative measures, and, in some instances, potassium iodide seemed helpful. The average was 38 days hospitalization, while the length of exposure averaged two to four months, ranging from three weeks to two years.

In the differential diagnosis with respect to the findings on one biopsy specimen, fungus infestation was considered, as was infection, but no evidence of either was found.

In considering an allergic reaction, skin injection tests were made, but on controls these were also positive. Moreover it is believed that, generally speaking, the condition does not fit an allergic picture.

Although the dust contains 5 to 7% free silica, the short course and the clearing roentgenogram does not permit of a classification as an inorganic pneumoconiosis.

Animal experiments were done, using Miller's dosage for peritoneal injections. The amount used by Miller killed animals, but half this amount gave severe reactions.

Separating the fractions of the material, the waxy fraction when injected causes the formation of so-called "foam" cells.

Lantern demonstration showed x-rays of chests and also pathological sections of the changes in the lungs.

It was concluded that this is a condition which clears in three to four months' time, caused by toxic material absorptive in type. The preventive aspects lie in adequate dust control.

DR. HUGO T. ENGLEHARDT, in discussing the presentation, stated that he had had clinical experience similar to that detailed, in patients working in insulation material, but that, because there was a variety of materials, the etiology had not been assigned. It is important to differentiate from other pulmonary diseases. Preventive measures were especially stressed.

DR. IRVING GRAY pointed out that a skin reaction was not an indicator of pulmonary disease, and that there was no positive relationship existing. The reactions in this series must have been because of sensitized skin, as was really pointed out by the essayist.

DR. PULLEN, in closing, stated that he felt that the skin tests were not important and that probably what was observed was an irritative phenomenon.

DR. BRUNO GEBHARD gave a lantern demonstration on the subject "Community Health Education by the Medical Profession."

Newer developments in curative and preventive medicine require more physicians as active advisers concerning the personal and public health of the community. A number of important points were stressed: (1) effectiveness of permanent health exhibits in the form of health museums; (2) importance of cooperation with lay groups regarding educational and financial support; (3) reaching uninterested groups by exhibits, with visitor participation through neighborhood exhibits; (4) analysis of visitors' reactions and of what people know and want to know; (5) evaluation of visual means against other educational material, such as pamphlets, newspapers and radio; (6) health museums as training places for medical and public health students and allied professions, with provision for internship in health education. These observations were based on the experiences and activities of the Cleveland Health Museum.

A short historical resume of the activities of the Museum was given: in 1936 the Cleveland Academy of Medicine through its health council studied the situation with respect to the founding of a scientific museum, which was incorporated in December, 1936. Funds were solicited and quarters obtained. It was especially stressed that a health museum differs from a medical museum in that the former is for the education of the laity.

Subsequent experience proved that the exhibits attracted the attention of those who will not listen to lectures or read, because facts are more easily remembered when seen than when only heard. In the subsequent financial experience of the museum about $110,000 had been collected, and now there has been an endowment of $400,000 made.

About 520 groups visited the museum last year, and medical, dental and nursing students make routine visits. Three internships have been established in health education.

With reference to the traveling exhibits, the one on "Food for Health" has been shown in 36 places. Seasonal exhibits are also made up from time to time, with appropriate titles and subjects.

On the first floor of the building are to be found exhibits on human biology, such as the hand of man, the heart of man, and the head of man. On the second floor are the exhibits on maternity, childhood, dentistry, nutrition, etc.

During the past year, 30,000 visitors were received, and there have been probably some 750,000 contacts established through traveling exhibits. About one hour is consumed for the visit through the entire exhibit.

Lantern slides in technicolor showed the various kinds of exhibits, the use of the building space, and types of health educational material.

Comparative costs between exhibits such as this and motion pictures led to the following conclusion: an exhibit of this sort can be prepared for an approximate cost of $20,000, which is the usual cost of 20 minutes of sound motion pictures.

DR. W. W. BAUER, in opening the discussion of this presentation, stated that he had visited this exhibit several times.

Most people are visually minded and learn much easier when they see as well as hear; perhaps this is the reason the radio alone will never accomplish what television may do.

A review of the important points by DR. BAUER was as follows: (1) liberal endowment by public spirited citizens; (2) the Prentiss Award for outstanding records; (3) support of the medical and dental professions; (4) leadership through the Academy of Medicine; (5) diversification and mobility; and (6) the establishment of a pattern and the adaptation of modern methods.

DRS. EMERY HAYHURST and CHARLES V. CRASTER and MR. HOMER CALVER completed the discussion. Approximately one question in a thousand of those asked of the American Medical Association in its service is published. The range of appeal was emphasized by DR. CRASTER. MR. CALVER reviewed the museum experience in this country and stated that an important principle is a cross between science and lay concepts; that one cannot successfully do both medical and health exhibits. It is most vital to reach the community.

DR. JOSEPH MOUNTIN, in giving the Chairman's Address, changed it slightly to read "Relocating of Physicians as a Prerequisite to Better Medical Service."

It is first important to consider supply and demand. The distribution of physicians was apparently better at the beginning of the century, but later urbanizing had its effects. A simple count is not the story; for example, rural physicians are generally older.

The year 1940 was taken as representative of peacetime conditions. Based on the census and the directory, there were available 175,000 physicians, which gives a ratio of one to 751 persons. There are, of course, great variations in the different states, as follows: New York 492; Mississippi 1459, etc.

The national situation has been changed because of the retirement of 10,000 physicians and 4800 in government employ, as well as those who are in institutions, hospitals, and various departments, which brings us down to about 136,000 in private practice.

Especially attracted to areas of larger per capita wealth and to urban areas in general are the younger physicians. The presence of general hospitals is also a drawing card to the younger group. The median age in the rural areas is 57, whereas it is 44 in urban areas.

With respect to the outlook, because of many younger physicians being in the armed services, there has been a considerable decrease of physicians in many areas, and less inclination to rural practice by younger men who are not in the armed services. For this reason, there appears to be a need for approximately 25,000 additional physicians. The difficulties behind these conditions are low income, lack of hospital facilities, and professional isolation.

To meet these difficulties, there should be provision of diagnostic facilities and educational upkeep projects in rural areas. Broad programs of insurance and financial assistance might improve these conditions.

Variations in Industrial Medical Service Plans

DR. JAMES M. ADAMS outlined the so-called Stancola plan, stating that it was originated by and supervised by the workers, there being a voluntary provision for family care. There is a full-time medical staff, and there is one fee regardless of the number of dependents. Both employer and employees contribute. Organized April 1, 1924, a sketch of the 20 years' experience was given.

A study of fees was begun in Louisiana groups of various types, where deductions were common. The plan was originally launched for 2200 persons and their families and, after a trial period, a full-time staff was appointed. There are now full-time specialists with some on part time, the hours being from 8:30 to 6:00 for the full-time professional participants. All men are graduates of Class A medical schools and all Fellows of the A.M.A. One day off each week is allowed for each person. Arrangements are so made that the service covers a radius of seven miles from headquarters. There is a hospital limit of $250.00 for each case.

Dues have now been put on a three-months basis, and there have been three assessments since organization. The x-ray department is separately financed. In 1930 the organization was incorporated as a non-profit group on a capitalization of $100,000. A board of directors of wide diversification has been appointed, and the activities are under the immediate direction of the medical staff.

The membership has increased one-third, but the service is now at its maximum on account of various wartime emergencies. As to cost, salaries involve 40%, hospitalization 20%, and administrative facilities 18%.

It is believed that there is a higher morale among the employees, that there is better service, higher medical income, and regular work and experience on the part of professional participants.

DR. M. S. BLOOM believed that services should be available to people at prices that they can pay, and that prepayment plans seem logical.

The essayist maintained private practice and also industrial practice, and was the medical director of several

groups, totalling 6000 employees and their dependents.

In one of the organizations, the Dunn-McCarthy Shoe Company, a clinic was started in 1913. In 1916 a medical director was appointed, and a contract plan was adopted in 1919 in which the employer contributed dollar for dollar; in the same year dependents were included in the service, with a limit of $250.00 maximum for dependent service. Sick benefits are limited to 10 weeks per year, and there is a maximum limit of $350.00 per year per case. Beneficiaries are allowed to choose their own specialists, surgeons and dentists.

In 1930 free choice was begun in the Spaulding group, in which there was an average cost of $26.00 and $24.00 in two plants, the average for all the group being $20.00. Here there was a limit of $50.00 for dependents.

In 1919 the Ansco plant was started, and in this group, in 1930, free choice was installed. The original 50-cent fee per week was raised to 75 cents eventually. Allowance for x-ray expense was increased in 1943, and a maximum allowance per case of $300.00 per year was established. There has been a schedule of fees on a yearly basis, and sick benefits have also been scheduled. In this group 167 physicians in 140 cities and 15 states were paid fees in 1943. If a surplus occurs, the benefits will be extended rather than to accumulate it.

The Binghamton Die & Machine Company is the smallest group, which averaged $17.00 annual cost.

Experience indicates that these plans can be successfully operated in various industries and can be adapted to any industry by adjustment of cost. Freedom of choice is preferred, through which there appears to be better and prompter service.

Efforts along the line of medical leadership must be increased, because health is a matter of growing concern. The workers favor the prepayment plan. Medical societies in some places appear to be reluctant, but it is vital that they furnish leadership.

DR. SIDNEY GARFIELD spoke on various aspects of the Kaiser projects.

Hazards are rapidly being controlled, and health is now a basic factor. There is, however, a lack of distribution of medical care. Some 300 plans have been examined and results show that there is one point in common—prepayment.

There has been a trend to bypass the medical profession in various government plans, and there has been too little disinterested thinking.

Prepayment, however, is not enough. Many such plans have failed. Blue Cross plans have limited hospital benefits and, in the main, society plans have not been practicable. The problem seems to be the provision of adequate care with limited funds.

Three elements occur in a simple plan which works: (1) prepayment; (2) group practice; and (3) adequate facilities. There appears to be no question about the advisability of Nos. 1 and 2; No. 3 essentially brings the service to the worker.

The experience here reported is based on a group of 80,000 persons over a period of 20 months; this is not a selected group, but contains 4-F's, the aged, and other unusual characteristics.

No pre-employment examination is done, because of objection by unions. More service, however, has been provided than ever before, hospital plans have been utilized, research is being undertaken, and extension is contemplated.

The only thing wrong with the plan is that it should not be fostered and managed by private interests; official medical groups should be sponsoring and maintaining this plan; there has been too much delay. Industrial physicians individually cannot be units, but groups can.

Similar plans could be adapted to the use of county medical societies on a budget basis including full-time physicians and surgeons, part-time private practitioners, and full-time private practitioners. Medical centers could be established in strategic areas, with subcenters for diagnosis and treatment.

An economic perspective should be developed by physicians looking to a proper service distribution; plans should be in the hands of physicians, to whom the leadership belongs; such consummation would provide services which could be touched neither by industry nor government.

Would it not be wise to create a new economics of medicine, paying for keeping people well?

DR. EDWARD M. JONES presented the Endicott-Johnson plan. The locations of the factories in New York are confined to a fairly small area. In 1918 a complete medical service was started for workers and dependents, in order to meet the cost of high service otherwise. A 5% deduction was returned during the bank moratorium.

In September, 1940, temporary workers were excluded from the service, and there was necessity for considerable adjustment.

Certain provisions have been made with reference to all dependent children, except those working elsewhere, and certain restrictions as to the living area in which service is given. Provision is also made for husbands or wives who are not employed.

The area served includes Binghamton, Johnson City and Endicott, and there are various specialists included in the diagnostic and treatment groups. State laboratories are used for the different kinds of tests necessary. A dental service is also rendered, as well as night service, including home and office calls, pharmaceutical service, and the like. Patients are sent to clinical centers in adjoining localities if found necessary, and expenses are paid. There is a voluntary sick benefit contribution, with a limited period.

The average cost has been $48.00 per year per worker, which increased to $57.00 in 1942 and to $63.00 in 1943.

In summary, a complete service is rendered, the physician-patient relationship is preserved, and specialists, laboratories, hospital and x-rays are available entirely free to the worker.

DR. JAMES C. MCCANN stated that the present crisis demands critical study and much planning to keep the fundamentals. It is important to transfer the responsibility to the community and to preserve the integrity of the medical profession.

The Massachusetts Society plan was set up to keep funds under financial control. Groups are best restricted to below 2000 for individuals and 2500 for families. A 70% participation on a contributory basis has been secured. Thirty-five thousand subscribers have been enrolled in a year and a half.

A directorate has been created of one-third medical men, one-third subscribers, and one-third industrial leaders. Affiliation has been effected with the Blue Cross plans.

Certain elements were emphasized: (1) hospital and medical service by practicing physicians; (2) no third party element; (3) not hospital dominated; (4) a prepayment contribution makes service readily available; (5) contracts should specify services, with respect to hospitals and physicians, with special arrangements for ambulatory patients.

Up to this time there have been statewide plans inaugurated in 16 states.

The plan described has operated in the black, retired its indebtedness and has a reserve of $35,000.

Soundness in such plans lies in (1) adequacy of the premium; (2) utilization rate; (3) level of public health and hospital services; (4) proper responsibility of the directorate; and (5) adherence to strict allowances.

There has thus been established an ethical service in all types of areas and groups, with medical care for the needy without disruption of social relationships, proper financial arrangements, and the safeguarding of medical freedom, with the result that medicine can adapt itself to the evolutionary changes involved.

DR. JOHN J. WITTMER presented the last discussion on the panel. We are not afraid of ghosts if a practical logic is used to save the situation.

There must be a practical plan to scatter the ghosts and silence the specter of governmental control. We must create an entity outshining other plans; the best defense

is a vigorous offense, through a scheme of voluntary health insurance which is complete, sound, ethical and attractive.

The paradoxical phenomenon of "indigents" who are tailor-made mendicants should not exist; these individuals could pay all or a part of the service rendered. If such practices were discontinued, a contributory share could be paid, and the medical profession could be remunerated for every service.

Experience in the Edison Company has shown a financial need for corrective services which exists everywhere. Employees under $3000 yearly income were asked to form a group and contribute 5/9 of the unit cost (which amounts to about 22 cents a week), the company supplementing this with an equal amount. This provided a complete service on a closed panel basis under the direction of the medical director and staff with free choice of physicians and dentists. Among the services rendered are examinations at employment, periodic examinations, examination on return to duty after illness or injury, first aid, treatment for illness, drugs, special diagnosis and treatment, laboratory facilities, cooperation with personal physician, physical therapy, dentistry, hospital operations, and convalescent home care.

As a result of this service, health standards have been raised, there has been decreased disability and a better morale tone, and absenteeism has been lowered one-half. All of these things have been accomplished without a financial burden, at a contribution averaging $11.00 a year per employee and $11.00 being paid by the company per employee, per year.

The advantages are obvious: the employee is helping to pay his own way, there is no charity; the physicians' incomes have been raised, because nothing is given free; there have been funds for research and prevention; there are early diagnosis and treatment; and more patients become well sooner and, therefore, are an asset to the community and the nation. The only dissatisfaction element has been the exclusion of families in this service.

Such a plan could be adopted by the profession generally. Action should be taken by proceeding with such plans on a large and extensive basis. A modern plan could be devised for the inclusion of all persons, which would preserve the dignity, and would become the privilege, prerogative, and duty, of the profession.

Questions were then asked from the floor of the meeting, in written form, including also some questions which had been previously submitted in writing. Excerpts from the answers are as follows:
answers follow:

ADAMS: The local medical profession first showed a passive resistance which became active and which later was overcome.

BLOOM: The medical profession has welcomed these plans because they were consulted about them beforehand and an economic committee was appointed. The unions in general are favorable to such plans.

MCCANN: We are looking for a program to be adapted to all people. An important question is involved with respect to continuous control of production in certain industrial groups.

WITTMER: It seems that industry wants the community to do this work, but industry has been forced into it thus far.

GARFIELD: Mr. Kaiser feels the community basis is the logical one.

WITTMER: The $3000 limit was a natural payroll division—that is how we came to use it.

MCCANN: Most states have established or proposed a $3000 boundary.

BLOOM: There is only an occasional tendency for physicians to charge more than the scheduled fees.

MCCANN: We have noticed a similar tendency, but it is probably due to a misunderstanding. We have placed a limit of $150.00 for surgical operations.

ADAMS: Our experience indicates a lower absenteeism and sick-rate on account of our plan.

BLOOM: There has been a gradual drop in absenteeism and sickness rates in the past eight years.

WITTMER: Our health standards have been raised, disability has been decreased, there has been a better morale tone, and absenteeism has been lowered one-half.

JONES: Our experience has been that the plan makes a difference with respect to taxes, pay schedules, and other similar financial items.

WITTMER: Our doctors are paid on a fee basis and also on a retainer basis, except that surgical operations are paid on a fee basis for each case.

GARFIELD: We have set aside a proportionate amount for what may be called needy care.

MCCANN: There has been no inclusion of psychosomatic problems.

WITTMER: We favor no waiting period and a total coverage plan.

GARFIELD: We do not favor a fee basis.

Section on Radiology

DR. C. D. SELBY discussed "Industry's Attitude Toward X-Ray Examination of the Chest."

Industry appreciates the importance of controlling preventable diseases in employees, especially those of an occupational origin and those of a non-occupational nature which are susceptible to aggravation by employment. Silicosis, an occupational disease, and pulmonary tuberculosis, a non-occupational disease, are examples. Through industrial hygiene methods, industry has endeavored with considerable success to prevent silicosis and to control activation of pulmonary tuberculosis. Nevertheless, in the absence of specific immunizing agents, industry recognizes the value of an early diagnosis of these industrially important diseases and through experience confirms the practicability and effectiveness of x-ray examinations of the chest as a means to that end. These interpretations of industry's attitude are based on observations of a health maintenance program in a group of about 300,000 workers.

Collectively there is really no defined attitude; this is generally determined by the medical official, the medical director, the consultant, part-time practitioner or friend, depending upon the size of the group. Usually the attitude is similar to that with respect to other diagnostic devices.

In non-occupational disease, the x-ray represents a spectacular instrument in case-finding. It should be remembered that management is just as susceptible as line workers. Illustrative cases were mentioned, one of the case of a manager who developed tuberculosis, and another of an athletic type of woman who presented an early lesion on the x-ray film of the chest; in the latter instance, because the patient was a popular person in the plant personnel, the news quickly spread and there were many volunteers for x-ray films of the chest. The manager of the organization expressed great satisfaction in the opportunity thus given for early diagnosis, treatment, and recovery.

Surveys cannot be successful unless there is good follow-up and coordination of community physicians and facilities.

As an example, in a case-finding survey of 6,505 cases, 15 were found to be active, six questionable, and four arrested. Other chest findings were also reported. There was an incidence of 70 per 1000 of chest conditions observed.

Another example was given of 47,000 chest x-rays taken in a group which represented one-fourth of the population of the city in which the group was located.

There are beneficial results of these surveys to both management and workers, particular emphasis being placed on the latter who must be convinced of the justice of the results, and there must be faith in the integrity of the physicians. There is considerable advantage in a mutual understanding between the personal and industrial physicians.

Interpretations must be supported by x-ray knowledge and experience, the radiologists being responsible for film reading and interpretation; film reading; and for reading films which are negative.

Allusion was made to a satisfactory meeting attended by members of the Council on Industrial Health, the Section on Radiology, and the American College of Radi-

ology, as well as other groups, with respect to mutual interest in the problems of this subject.

COL. A. J. LANZA opened the discussion of Dr. Selby's presentation.

The x-ray is becoming very widely acceptable in industry and represents an exceptionally fine diagnostic instrument. There is an increasing demand for installations in industrial plants. As a diagnostic instrument, it is especially applicable to persons who are apparently well.

Two distinct applications have been general: (1) in the pre-placement examination and (2) for case-finding in tuberculosis cases or suspected tuberculosis, now used in many groups.

The situation with regard to commercial agencies needs clarification, and also should have guidance by the Council on Industrial Health.

There should be distinct medical appraisal of films, and such appraisal should be confined to those who are qualified to do interpretations. Emphasis was especially placed on quality.

DR. SIMOND S. LEOPOLD presented the subject "Benign Pneumoconiosis."

Experiences in pneumoconiosis illustrate the necessity of recording from time to time that there are benign pneumoconioses which have patterns of nodular shadows that simulate those produced by silicosis. A discussion of the various pneumoconioses that produce these pattern was presented, with illustrative lantern slides.

Pneumoconiosis is a broad term and includes (1) silicosis and asbestosis; (2) modified silicosis produced by free silica and non-siliceous dusts; and (3) benign types produced by organic or inorganic dusts which are neither toxic, allergic nor pathologic. These latter dusts produce changes which only cast shadows, such as, for example, barytosis and siderosis.

The work of ENZER and SANDER was reviewed, and to this the authors added a series of 11 iron cases, believing that others will be added in the future. Of these, five had healthy chests. The industrial plants where these persons worked were visited, and it was determined that there was no silicosis hazard present in the occupation from a survey made by the Industrial Hygiene Bureau, showing an average of four million particles of dust per cubic foot, 99.5% of the particles being less than 10 microns in greatest diameter, and the rafter samples showing 0.3% free silica.

Case reports were given and lantern slide x-ray films were shown on cases of rheumatic fever in which there is a psuedo-nodulation, caused by a deposition of iron pigment. It is believed that this is an endogenous siderosis.

Differential diagnosis rests on clinical findings, the results of physical examination, consideration of the occupation, and the exclusion of other conditions. Especially important are the industrial environment and the results of industrial hygiene engineering surveys.

This is a subject which demands our utmost and careful consideration.

COL. A. J. LANZA opened the discussion of DR. LEOPOLD'S presentation. This is a most timely paper. In our experiences we have learned that shadows on the x-ray film of the chest are not necessarily those of a disabling condition.

The University of Pennsylvania has been at work on these problems since 1920. As many chest x-rays began to be made, it became obvious that the occupations were important and that the whole working history was significant.

Ultimately, there was a distinct realization that there was a great variety of non-occupational manifestations in x-ray films of the chest, and also the vital necessity for differential diagnosis.

One is forcibly reminded of what Dr. Henry Pancoast said long ago: "Let's not talk of a normal chest, but rather of a healthy chest." Our work, therefore, boils down to a separation of the healthy from the unhealthy.

DR. I. S. TROSTLER suggested that the fluoroscope could be used as a differential diagnostic medium—in benign pneumoconioses there is a normal excursion of the diaphragm.

DR. NORBERT ENZER made allusion to the original report published by him and DR. SANDER in 1938. There have been three postmortem confirmations in the series, showing the following pathological characteristics: (1) the lesion is a macrophage reaction, with no other inflammatory response; (2) there are no changes in the blood vessels; and (3) there is no collagen formation in any stage—this is the change that really affects blood vessels in the malignant types of disease.

In the benign type of pneumoconiosis (and especially in experience with siderosis) the x-ray shadows when "blown up" are circular and tend to undulate.

MAJOR RICHARD E. KINZER presented "An Analysis of Disqualifying Conditions Found During the Chest X-Ray Examination of 105,141 Selectees," with a lantern demonstration.

The war effort has presented an unusual opportunity for the physical examination of millions of the nation's men and women. Routine chest x-ray films became a part of the physical examination for selectees soon after the selective service system began functioning. Since that time, no less than one-tenth of the total population of the United States has had a chest x-ray examination as a direct result of the war effort. Several reports of the results of this mass examination have appeared in the literature. Statistical reports for the country as a whole will undoubtedly appear after the war. Until that time, localized reports from various sections of the country will be of interest to the medical profession.

In 1940, Spillman pointed out that the case cost of tuberculosis is varied from $7000 to $10,000, while the cost of disability payments aggregated one billion dollars.

The need for mass chest x-ray examinations became apparent in the fall of 1940, and, in November of that year, the U. S. Public Health Service started its work in assisting the armed services groups. By the summer of 1941, facilities became established. Within a period of 22 months (August, 1941, to May, 1943) 105,000 examinations had been made in a sparsely populated section of the country. In 80% of instances, a 4 x 10 stereo was used, with 14 x 17 films in doubtful or suspicious cases.

The results showed that 1328, or 1.26%, were disqualified, some of these being deferred only and some being duplicated. Of these, 999 (or 75% of the 1328) showed pulmonary tuberculosis, pleurisy, or other similar conditions. Other usual pathological conditions were found, but were much in the minority.

The total number of rejections for tuberculosis represented only 0.75% of the total number of examinees.

In general, it was disclosed that the incidence was higher in urban areas than in rural areas.

Control of Dermatitis from Oranges

HUGH DIERKER, M.D., M.P.H.,
Chief, Division of Industrial Hygiene,
County of Los Angeles Health Department

RECENTLY, the Division of Industrial Hygiene of the County of Los Angeles was called in by a small producer of fruit marmalades and jellies. This concern had operated for a considerable period without experiencing any dermatitis from juices of various citrus fruits that he was processing. However, just recently a considerable tonnage of Seville oranges was converted into marmalade. After the oranges had been thoroughly washed and dried, they were peeled. This operation involved removal of the orange skin and also pithing and cutting up of the orange. Five of the 10 employees engaged in this operation showed a diffuse erythema of the dorsum of the hands and wrists and the webs of the fingers. One of these workers also exhibited this redness extending up to the elbows, while two others exhibited small blisters superimposed upon this erythema. Patch tests were made upon eight other people with aqueous and carbon tetrachloride ex-

tracts of the skins as well as the juices from these oranges, and compared against similar extracts from Navel oranges and controls. None of the subjects reacted to any of the materials. It was impossible to run these tests on the employees who had been affected with erythema. So, from the patch tests it was concluded only that no primary irritant was the cause of the trouble, but rather that the increased acidity of this orange plus the continuous wetting of the hands caused the dermatitis. The following prophylatic rules were instituted:

1. Thorough washing of hands and arms at beginning of shift, followed by the application of a protective cream designed especially for use with acids.
2. Rule No. 1 should be repeated every two hours during the work day, using a bland non-irritating soap.
3. Containers with a solution of sodium bicarbonate, one tablespoonful to a quart of water, should be placed on the work table for frequent rinsing of the hands, arms and instruments used in the work. This solution should be made up fresh twice daily.
4. If gloves are used they should be worn with the cuff turned down one inch so as to prevent juice running up the arms and into the gloves. At the end of the shift these gloves must be washed in soap and water and turned inside out and allowed to dry completely by the beginning of the next shift. There must be no exchange of gloves, i.e., each person is to be assigned a single pair of gloves and is to be made responsible for the maintenance of them. The use of gloves was not made mandatory.

A short time after this program was established, the dermatitis cleared up, and to date there have been no new cases.

Industrial Health Forum

—This Material is prepared by the Division of Occupational Hygiene, Massachusetts Department of Labor and Industries, Boston—

Records for First Aid Room

QUESTION: I am a registered graduate nurse working alone in the first aid room of an industry employing 600 people. The doctor comes in once or twice a week to do pre-placement examinations and to see cases needing special attention. He does not approve of written standing orders. Although I use only those treatments that have been recommended from time to time by our doctor, there are times when I feel that I am not adequately protected. I make a record of all visits for industrial accidents and illnesses that occur during working hours. Oftentimes I am consulted as to conditions that have no connection with occupation. It is these patients that worry me more than the industrial cases. Are records of any legal value on non-occupational accidents and illnesses?

ANSWER: A record should be made of every visit to the dispensary, whether you give treatment or advice only. The memorandum of the visit written in your daily log in the presence of the patient and initialed by you is indisputable legal evidence if it is dated and legible. If you confine your clinic service to practices approved by your doctor in first aid and make a careful record of symptoms and treatment, you have little or nothing to worry about. "Jurisprudence for Nurses," by C. Scheffel, published by Lakeside Publishing Company, New York City, may be used for reference.

Dermatitis from Lactic Acid

QUESTION: We are now using lactic acid in a new operation, and our workers are developing a rash on their hands. I understand that the material has been used for some time in the textile industry and wonder whether there is information available regarding possible dangers to health from this material and how to protect against them.

ANSWER: Lactic acid, like any acid, if used long enough and in sufficient concentration, will produce dermatitis. In concentrated solution it may cause ulceration of the skin and also produce lesions of the nails. It is described in the literature as an allergic agent in a small proportion of people and may produce dermatitis in sensitive individuals. A case of itch in a baker was ascribed to this cause and proved by patch tests. Protection against this material is similar to that in any dermatitis, namely, proper engineering and work methods to minimize contact with the material, the use of rubber gloves, if contact with the skin is unavoidable, and good personal hygiene to remove any of the irritant at the end of work period.

Heat Treating with Cyanides

QUESTION: I am very much interested in learning the chemical reaction when hot metal tools are dipped into a bath of potassium and sodium cyanide and then plunged into oil or water.

ANSWER: The use of potassium and sodium cyanide in the heat treatment of metals has led to little evidence of harm to exposed workers. This does not imply that cyanides are not poisonous, but only that in industry few acute and fewer chronic poisonings from such agent have ever been substantiated.

When hot metal is plunged into molten cyanide, various chemical reactions take place within the steel itself. The major changes, however, are physical ones, namely, a rearrangement of the crystal structure within the metal and penetration of carbon into the steel. Some of the cyanide may be converted into carbonates, and the dross which collects around the cyanide pot, if analyzed, will be found to consist chiefly of carbonates with only a very small amount of cyanide. Plunging the heated metal into oil or water containing sulfide usually causes no reaction, because the cyanides are alkaline. The reaction from the cooling is again chiefly physical within the metal itself.

Magnesium Dust

QUESTION: Is magnesium dust harmful when breathed in? I work in a powder plant, and I have had some tightness in the chest and a cough, but my doctor informs me that the x-ray is negative. I feel better when I am away from the plant. There is very little dust in the air, but one or two others say that it also bothers their chests.

ANSWER: Magnesium dust when inhaled may produce the symptoms described, that is, tightness in the chest, cough and some irritation of the nose and throat. However, magnesium dust is very explosive, and it is essential for the plant to keep the level of air contamination below the explosive limit. This level is well below the amount that may cause any real injury to health.

Wearing of Safety Glasses

QUESTION: In our plant we have a large labor turnover. Workers appear to be independent and pay little attention to safety instruction. The majority of men will not wear the safety goggles. On questioning the workers, they say the goggles do not fit, are bad for their eyes, are heavy, collect moisture, etc. What can a nurse do to overcome these objections?

ANSWER: Persuade your personnel director to refer all employees to you for education in conservation of eyesight. You can obtain helpful literature and counseling from the National Society for the Prevention of Blindness, 1790 Broadway, New York City. Excellent ideas are to be found in the March, 1944, issue of *The National Safety News*. It is true that goggles should be adjusted to the individual. Good safety goggles with plastic frames can be obtained weighing only four ounces, and the objections of workers may be overcome by individual instruction.

In problems dealing with attitudes of workers generally, education is often best handled through a labor-management committee.

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The Scientific Approach

IT HAS long been a criticism of industrial medicine that it isn't "scientific." This has not been taken too seriously by the men who are most familiar with the subject; they have felt that, in time, it would evolve its science—on a basis comparable to that of any other department of medicine. The evolution is obviously progressing, for now it is asserted that the lack is not so much the science as it is the "scientific approach" on the part of those who are describing their experiences or voicing their views. This has led us to inquire what the "scientific approach" to industrial medicine would be; and the quest for a definition elicits some interesting things. On the principle of the Gallup poll—which, we read, is obtained by "scientific" sampling—we can conclude that the scientific approach to industrial medicine is *by way of* one or more of the following: (1) the technical—rules, formulas; (2) the statistical—tables, graphs, percentages; (3) the clinical—case records and studies; (4) the laboratory; (5) the mathematical; (6) animal experiments; (7) immolation in pure research; (8) university courses; (9) expressions, such as articles, in technical and "scientific" language; (10) a reputation as an "expert," from much writing or speaking; (11) assemblies of factual data; (12) a process of reductions to standards; (13) a superstructure of intellectual enterprise, above the necessities of routine practicalities; (14) a thoughtful admixture of theory and practice, experience and common sense; (15) the adaptation of past knowledge to future needs. This is a general, and possibly "scientific," ordering of the opinions. Some comments seemed a little colored with a bit of yearning toward the cool halls of knowledge or the secluded purlieus of preference. And almost all contained the implication that any pure science of industrial medicine will be difficult to arrive at so long as the "medicine," as it were, must be "industrial"; there is always the drag that, while the human element in industry offers the opportunity of mass study, it continues to require the individual, personal, treatment. Thus it appeared that there was a general—if unspoken and a little grudging—admission that: "Science may be described as a classified index to the successive pages of sense impression, which enables us readily to find what we want, but it in no wise accounts for the peculiar contents of that strange book of life." Which one, and how many more, of the foregoing avenues of approach may be necessary for the really scientific, we leave to someone with more scientific assertiveness than we care to assume. Meanwhile, we shall proceed from the premise that all of them, excepting probably Nos. 9 and 10, are part of the lead-up to the development of whatever science may be capable of formulation from this subject. It is true that "a science teaches us to know and an art to do, and all the more perfect sciences lead to the creation of corresponding useful arts." But what science of knowing has ever developed without its concurrent art of doing? And how often the art has preceded the science—for the "know how" must be learned before it can be taught. That is why we are advised: "In science, read by preference the newest works; in literature, the oldest." The art of industrial medicine has long been highly developed; and it is the many masters of the art, whose careers are involved in its practice, who have developed it. The science of industrial medicine, in so far as it has taken shape, has emerged from their individual and cumulative experiences in the application of the art. Their approach to the science is through the art. And thus their continued expressions, by way of the elements of the foregoing opinion analysis, is undoubtedly "scientific" enough as an approach to the subject, even though these expressions continue, as in the past, to be deeply involved with "that strange book of life," written in terms of the human element. Meanwhile the "scientist" who attempts too fully or too soon to standardize industrial medicine into an exactitude of "science" that fails to allow for the human element—individual and collective as it is found only in industry—will discover that he has an eel by the tail.

Dr. Pilgrim

THIS contemplative gentleman has been too busy, of late, to philosophize. His progress now is westward, on a long pilgrimage, as it were, to the scenes of much that is of great industrial medical interest on the Pacific Coast. He did, however, find time to send us the following quotation from his favorite style-book—commenting that, although this was written nearly 300 years ago, it significantly describes what the physician and surgeon in general practice is expected to do, and then rises to the climax of telling what the physician and surgeon in industry does: "He will also build up that which was broken, and will strengthen them that are sick. He procureth health where there is none, and continueth and increaseth it where it is." Possibly the good DR. PILGRIM intended us to draw our own inference, to the effect, perhaps, that preventive medicine is not a new idea.

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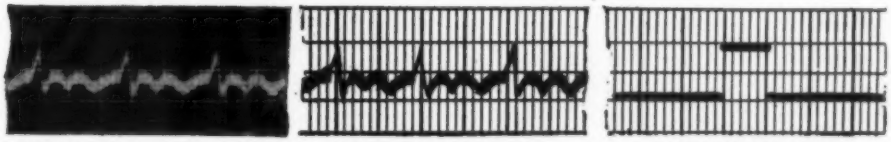

FIGURE A—Photographic Method FIGURE B—EPL Method FIGURE C—Calibration

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Post-Graduate Industrial Conference

—Papers of the Second Annual Post-graduate Industrial Medical and Surgical Conference of the Michigan State Medical Society, Thursday, April 6, 1944, Detroit—
Abstracted by
C. O. SAPPINGTON, M.D., Dr.P.H.

SPONSORED by the Committee on Industrial Health of the Michigan State Medical Society and the MICHIGAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, in cooperation with the Department of Post-graduate Medical Education, University of Michigan and the Wayne University College of Medicine, the Second Annual Post-graduate Industrial Medical and Surgical Conference was held as above noted.

GENERAL Chairman: KENNETH E. MARKUSON, M.D., Lansing, Chairman, Committee on Industrial Health, Michigan State Medical Society.

Morning Session:

Presiding Chairman: EDGAR H. NORRIS, M.D., Detroit, Dean, Wayne University College of Medicine.

Address of Welcome: C. R. KEYPORT, M.D., Grayling, President, Michigan State Medical Society.

"Newer Trends in Industrial Sanitation"—MOHE H. SOLWORTH, Louisville, Kentucky, Sanitation Consultant.

"The Psychiatric Approach to Current Mental Health Problems in Industry"—LEONARD E. HIMLER, M.D., Ann Arbor; Consultant in Psychiatry, Detroit Transmission Division, General Motors.

"How to Control Epidemics of Occupational Dermatitis, with Special Emphasis on the Epidermophytoses"—SAMUEL PECK, SENIOR SURGEON (R), U. S. P. H. S., Bethesda, Maryland.

"Criteria for Employability of Individuals with Lung Pathology"—CHARLES-FRANCIS LONG, M.D., Philadelphia; Chairman, Commission on Industrial Health and Hygiene, Medical Society of the State of Pennsylvania.

Afternoon Session:

Presiding Chairman: ALBERT C. FURSTENBERG, M.D., Ann Arbor; Dean, Medical School, University of Michigan.

"In-Plant Rehabilitation Programs for Disabled Veterans"—MARION JOCZ, M.D., Detroit; Physician-in-charge, Diagnostic Division, Chrysler Corporation.

"Eye Pathology due to Exposure to Organic Solvents"—MELVIN H. PIKE, M.D., Midland; Consultant in Ophthalmology, Dow Chemical Company.

"A Comparison of Various Salt Solutions in the Treatment of Burns"—CARL A. MOYER, M.D., Ann Arbor; Assistant Professor of Surgery, University of Michigan.

"Clinical Uses of Penicillin"—JOHN WINSLOW HIRSHFELD, M.D., Detroit; Assistant Professor of Surgery, Wayne University College of Medicine.

DR. L. E. HIMLER discussed "The Psychiatric Approach to Current Mental Health Problems in Industry."

DR. FRANK TALLMAN believes that industry and psychiatry must learn to speak the same language if they are to work together successfully; the task for the industrial psychiatrist is, therefore, one of an integrator who coordinates the contributions of medicine, psychology, social case work, and education.

ANDERSON believes that the task of psychiatry in industry is much less that of providing clinical services for individual problem workers than it is to integrate its techniques with all personnel procedures connected with employment, placement, training, promotion, or discharge of employees.

SELBY has stated that industrial physicians are as aware as general practitioners of the fact that every patient who consults them has in some degree a mental hygiene problem, and, in so far as physicians take opportunity to listen sympathetically to the men and women who consult them, they are already employing a very practical type of psychotherapy. Studies of job separations reveal repeatedly that personal and social maladjustment is much oftener the cause of difficulties than lack of occupational skills. As Dr. Ralph Lee has said, it is due to "humanics" rather than "mechanics."

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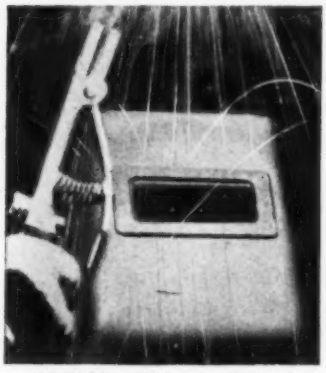

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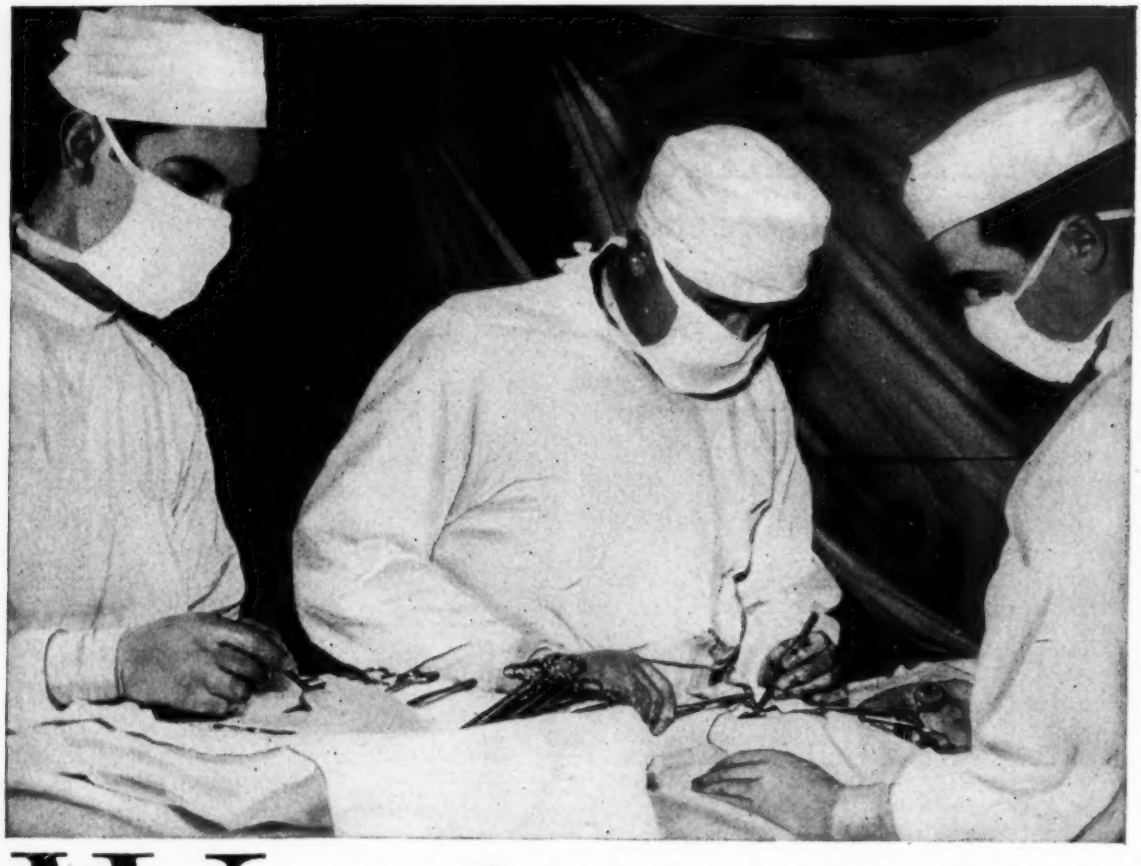

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quality, with an ear to past conditioning factors and an eye, figuratively, on future implications, while the hands are intimately in touch with the presenting situation, drawing out and "sampling" typical personality reactions. This technique can be applied with equal success to absentees when they return, and to disturbed human relationships within the plant, as well as to returning war veterans.

In summary, while psychiatry does not offer ready-made solutions to industry's manifold problems in the field of human relations, it does offer an approach and a technique for constructively influencing inter-personal contacts on all levels of the industrial social pyramid. Diagnostic and therapeutic interviewing techniques are not only being tooled to meet industry's changing needs, but they can also be taught and effectively demonstrated "on-the-job."

DR. SAMUEL M. PECK presented the subject "Prevention of Epidemics of Dermatitis in Industry Including Dermatophytosis." Most of the cases of industrial dermatitis are due to chemical agents, while physical agents and bacteria, including fungi, play a minor role.

To prevent or control an outbreak, it is necessary to have sound knowledge of (1) the industrial processes; (2) chemicals encountered by the worker capable of producing a dermatitis; and (3) the mechanisms by which these chemicals produce the irritation. When these are thoroughly understood, there are logical methods for prevention, control and treatment which can be instituted.

It is especially important that physicians understand processes and materials, and visit the workplace where patients are employed. Industrial chemicals belong to one of two classes with reference to this problem—they are either primary irritants or sensitizers—primary irritants may also be sensitizers. Most industrial dermatitis is due to the primary irritants, such as sulphuric acid, nitric acid, and other caustic substances; for example, dilute primary irritants or those which are contacted intermittently are more insidious and often more responsible for large numbers of cases, which can be referred to as epidemics. Cutting oils and solvents are two examples which are worth citing as to mechanism of production of irritation. Petroleum hydrocarbons have the property of producing hyperkeratosis of the epidermis which leads to the formation of the comedo; sulphur and chlorine compounds in the oil are capable of causing inflammation around the hair follicles. Bacterial infections of such lesions cause boils, and are complications rather than original effects. Soluble cutting oils as a class do not cause dermatitis as frequently as insoluble oils, but, if they contain sufficient amounts of sulphonated mineral oils, they may defat the skin, and if they contain large amounts of antiseptics or chlorine they may cause allergic dermatitis.

Solvent dermatitis presents a very typical picture, in which the fats and oils have been removed from the skin by the solvent action. Hands, wrists, and forearms are usually affected. Dryness takes place and fissures may form, the keratin may become dissolved, and vesicles may be seen.

Sensitizers cause only about 20% of all contact dermatitis, but it is impossible to foretell what substances may have sensitizing effects.

When a new chemical is introduced, it may be a primary irritant or a sensitizer, or both—as to whether it is a primary irritant can be determined by its action on the skin of laboratory animals, and as to its being a sensitizer, the "prophetic patch test" of Schwartz and Peck has been employed to determine this part of the problem.

With respect to general preventive measures, pre-employment patch test is not advisable because workers are not allergic to chemicals with which they have had no previous contact. The test is useful only as a diagnostic measure in those workers who give a history of a dermatitis in previous employment where some chemical contacts have been present. However, in the pre-employment examination, applicants with certain skin eruptions should not be employed where there are marked skin hazards, and applicants with dry skin should not be given employment where there is exposure to solvents.

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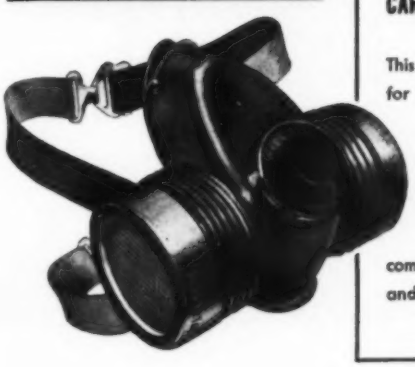

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Proper hygienic working environment includes enclosure of all processes wherever possible; scrupulous cleanliness of floors, walls, and ceilings; provision for protective devices, such as metal aprons on machines and filtering devices; protective clothing to safeguard the part of the body particularly exposed (especial attention to type of fabric is essential to good protection), and personal cleanliness as the most important single preventive measure—this includes proper cleansing facilities and non-irritating cleansers.

Finally, the subject of epidermophytosis has been for many years the boogey-man of the industrial physician. Epidermophytosis, however, among the industrial population is no greater than it is in the local population where a plant is situated, and it is still a debatable point whether fungus infestations can be easily acquired from shower-room floors. Studies have revealed that epidermophytids on the hands of workers are a rare occurrence, but it is only with epidermophytids of the hands that allergic contact dermatitis is likely to be confused. Preventive measures include the wearing of wooden-soled slippers, periodic scrubbing of shower-room floors with an antiseptic, and the use of an antiseptic foot powder for each individual. Finally, the individual should be instructed to report for medical attention and advice when active lesions appear on the feet.

DR. MARION JOCZ discussed "Rehabilitation Problems for Disabled Veterans."

The problems of re-integrating and rehabilitating handicapped service men is logically composed of two parts: the first concerns proper functional placement as to job and environment; the second concerns the physio- and the psycho-therapy necessary, subsequent to employment, solidly to adjust the handicapped to peacetime vocations. For convenience, these phases of the program are referred to as pre-placement and post-placement rehabilitation.

The medical department should classify each individual, depending upon the examination results, into one of three general classifications: (1) physically qualified for any job; (2) not physically qualified for any job; and (3) physically qualified for jobs not harmful to the individual's disability. For individuals classified in the third group, a code might be established which defines the individual's disabilities in functional terms—code letters to define broadly the individual's capacity to do heavy, moderately heavy, light or very light labor, and a series of modification code numbers could be used for the interpretation of specific disabilities.

It is thus apparent that the physician is not examining the man for a particular job, but for a group of jobs which might be filled by a group of individuals.

After the applicant returns to the personnel department with his functional code classification, the department proceeds to place him in accordance with the available data expedited by a matching process made possible through job surveys, which define each job within the plant in terms of specific physical requirements and functional capacity necessary.

The second part of the program—the post-placement phase—should begin where the first part stops. It is not possible or feasible to outline a rigid program here, but it would seem that the best post-placement rehabilitation program might be that which provides for both governmental and industrial medical participation. And in doing this, having once satisfactorily adapted a physical handicap to a work environment, mental compatability can be practically measured by the Minnesota Multiphasic Personality Inventory. This test consists of 550 statements, each printed on a separate card, and can be self-administered. The statements refer to the subject's general bodily health, habits, occupational, religious and social and sexual attitudes; family and marital relationships; moods, morale, phobias, obsessions, compulsions, delusions, hallucinations, and so on. The subject is given cards and asked to sort them into three groups—true, false, and cannot say. Only significant answers are recorded on a record blank, and transparent templates are used for obtaining the various scores. These scores can be plotted as "profiles."

In conclusion it can be stated that the problem of re-

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Sharp & Dohme, Philadelphia 1, Pa.

1. American Institute of Public Opinion, 1943.

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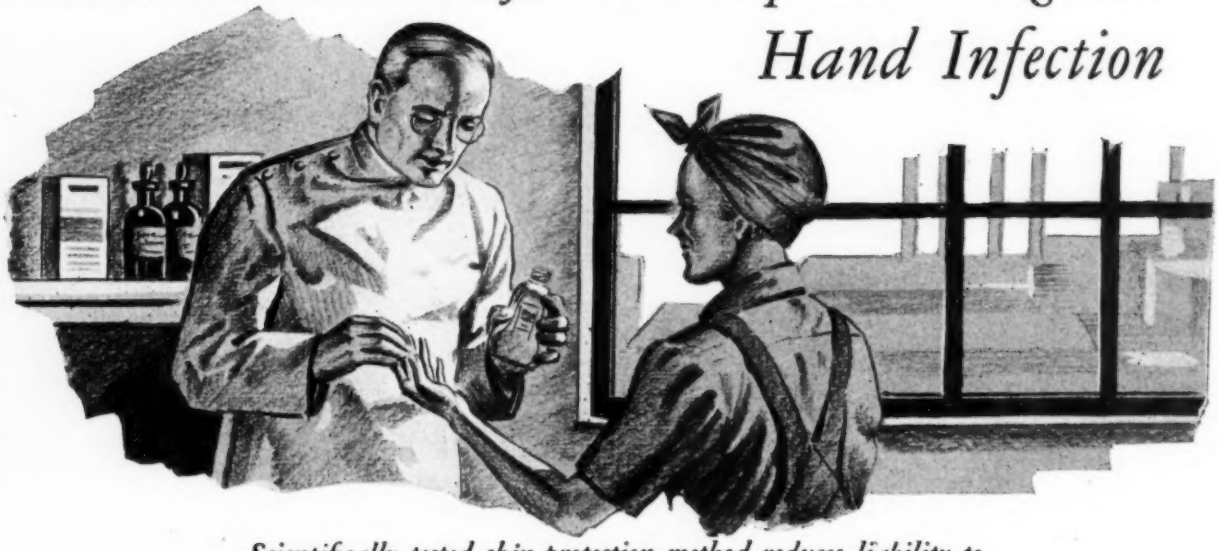

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habilitation in its broadest aspect is, after all, of enormous scope and will not be solved unless all concerned are equipped and prepared to meet it.

DR. MELVIN H. PIKE presented a paper on "Ocular Pathology Due to Organic Compounds."

This included a discussion of the need for toxicological information; control measures taken within industry; contributions of biochemistry and allied sciences; examples of chemical compounds which produce pathological changes (including benzol, naphthalene, beta-naphthylamine, dinitrophenol, and para-dichlorobenzene); and clinical experience and experimental work with vapor exposures and oral administration of the various solvents.

The occurrence of cataracts, optic atrophy, retrobulbar neuritis, and other ocular disturbances has given considerable impetus to the interest in this field of study. The frequency of ocular injuries is about 25%, and the cost to industry is about 50% of all the injuries coming to first aid. The immensity of the problem requires a physician, a safety engineer, and a chemist to prevent and control chemical injuries. Many protective techniques peculiar to the chemical industry are now in operation to control toxic materials, gases, dusts, sprays, and vapors; to shield against flying objects and radiant energy; and to provide the worker with adequate and suitable illumination.

The results of experimental work on animals with certain of the compounds named were detailed both as to a description by word and also by lantern slides. Motion pictures were also used to good effect in illustrating ocular changes.

In summary, it was stated that cataracts were produced in rabbits by the oral administration of naphthalene; the progressive pathological lens changes were recorded by means of color photography.

While repeated exposures of rabbits to high concentrations (4.6 to 4.8 mg./1) of para-dichlorobenzene vapor produced definite intoxication, including tremors and toxic eye-ground changes, no lens changes were observed.

Prolonged oral administration of definitely toxic quantities of para-dichlorobenzene to rabbits did not produce any lens changes whatever.

Finally, clinical experience, together with evidence gained from experimental work with animals, led the speaker to believe that cataracts are not produced by para-dichlorobenzene, either by oral ingestion or by inhalation of its vapors, in either man or rabbits.

DR. JOHN WINSLOW HIRSHFELD discussed the "Clinical Uses of Penicillin."

Considerably over-rated by some and under-rated by others, penicillin nevertheless heralds a new era in our battle with pathogenic bacteria. Moreover, it has encouraged bacteriologists to search for other substances elaborated by micro-organisms, and already many new compounds have been isolated and tested, some of which appear promising. The present paper can be abstracted briefly under the following headings:

HISTORY—Discovered in 1929 by Fleming. Attempts to chemically identify the substance in 1932 by Clutterbuck, Lovell and Raistrick. Little done until 1939, when Florey organized a team of research workers at Oxford. This investigator and his co-workers published promising animal experiments in 1940 and 1941, when arrangements were made for the production of penicillin in the United States. From this time on, progress has been rapid both in production and purification of the substance and its employment in the treatment of infections.

CHEMICAL STRUCTURE—Exact chemical structure is not known, except that the substance is an acid and is usually prepared in the form of its salts. The drug must be standardized biologically in terms of its power to prevent the growth of bacteria, using the so-called standard Oxford unit. It is an exceedingly powerful antibacterial substance and is capable of preventing the growth of staphylococci and streptococci at dilutions between 1:50,000,000 and 1:100,000,000, producing morphological changes at dilutions of 1:256,000,000. Action is mainly by bacteriostasis, but it does kill bacteria under certain circumstances.

EFFECTIVENESS—Effective only against certain organisms including pneumococcus streptococcus hemolyticus, staphylococcus albus (some strains), staphylococcus aureus, meningococcus, streptococcus viridans, B. subtilis, Cl. welchii, V. septique Cl. histolyticum, B. sporogenes, B. oedematiens, B. sordelii, lactobacillus, cryptococcus hominis.

ADMINISTRATION—It can be administered intravenously, intramuscularly, intrathecally, intrapleurally, intra-articularly, intrapericardially or intraperitoneally. It cannot be given by mouth because it is destroyed by the hydrochloric acid of the stomach. Gram-negative organisms are able to destroy it, and thus rectal administration is not satisfactory. The intravenous route has received the greatest attention. A continuous infusion is the better way to administer the drug because introduction can keep pace with excretion and the blood level can be kept fairly constant. However, because of the difficulties involved in intravenous administration, many investigators have resorted to intramuscular injection from which it is rapidly absorbed, reaching fairly high levels in 15 to 30 minutes.

ACTION—Mainly bacteriostatic, in some instances bacteriocidal. The action is not immediate, but requires several hours, and, unlike the sulfonamides, it is not hindered by pus, tissue autolysate or para-amino-benzoic acid. It is effective against large numbers of bacteria.

REACTION—The present varieties of reaction include urticaria, with or without fever, occasionally associated with abdominal cramps and pain in the joints; fever during the first five days of therapy; transient azotemia; thrombophlebitis at site of intravenous injection. None of these manifestations is severe enough to require cessation of treatment.

OPTIMUM CONCENTRATION—To effect optimum concentration one must know three things: (1) concentration of penicillin required to inhibit the growth of the offending organism; (2) routes by which the drug may be administered; and (3) the amount of the drug required to achieve and maintain desired concentration according to the route of administration selected. Required concentration can be determined by testing the organism in vitro against different concentrations of penicillin.

RETROSPECT AND PROSPECT—Penicillin has been employed in a wide variety of surgical infections with excellent results in most cases of staphylococcal infection or staphylococcal infection complicated by bacteremia. Effective results have been seen in acute osteomyelitis, but the treatment of chronic osteomyelitis has been disappointing—except as an aid in removal of dead bone and the healing of sinus tracts. Hemolytic streptococcal infections respond almost dramatically. Mixed infections, especially war wounds and compound fractures, seem more resistant than when a single organism is involved. There is great promise as an aid in the skin grafting of third degree burns. It will require increasing experience to delineate accurately the optimal dosage of penicillin for various infections.

Industrial Hygiene Engineering

—In the Army Explosives Manufacturing and Processing Industry—

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BEFORE discussing the actual program, let us review briefly the history of the program to date so that the existing administrative setup may be better understood.[1] Early in 1941—almost a year before Pearl Harbor—the U. S. Public Health Service was requested by the Secretary of War to make industrial hygiene surveys in the Army Ordnance Establishments for the purpose of appraising the health hazards and advising management of these establishments in maintaining working conditions and the health of the employees at a high level. Such surveys were begun

[1] Read at a meeting of the Rochester Section, American Chemical Society.

immediately by experienced personnel and are still being carried out routinely in these plants. Sometime later the Army Industrial Hygiene Laboratory was established and similar surveys were begun by the personnel of this organization.[2, 3] At the same time the individual State Bureaus or Divisions of Industrial Hygiene are conducting industrial hygiene surveys in the privately owned plants manufacturing or processing explosives for the Army.

Obviously considerable lack of coordination resulted from this arrangement, so industrial hygiene personnel were assigned as representatives of The Surgeon General's Office to the Safety and Security Branch, Office Chief of Ordnance late in 1942 for the three fold purpose of (1) coordinating the activities of the three governmental industrial hygiene agencies in the plants under consideration, (2) coordinating the industrial health and hygiene programs in these plants with the safety programs, and (3) assisting management, and medical, engineering and safety personnel in the plants on all special industrial health or hygiene problems. This coordination group consists of one Army Medical Corps Officer and two Public Health Service Officers.

Under this administrative arrangement, which has now been in existence for well over a year, the industrial hygiene surveys by the three types of governmental agencies are initiated by us,—the surveys in the Army-owned and operated establishments are conducted by the Army Industrial Hygiene Laboratory, in Army owned contractor-operated plants by the Public Health Service, and in privately-owned and operated plants manufacturing or processing explosives for the Army by the State Bureaus or Divisions of Industrial Hygiene. All reports of such surveys are forwarded to the plants and to interested agencies through our office where they are reviewed critically and changed, if necessary, for the sake of uniformity and consistency, and to comply with the various safety regulations existing in these plants. We keep in very close touch with conditions in the plants, particularly the Army-owned plants, through the safety inspectors from the Safety and Security Branch, who make complete safety audits frequently and routinely at these plants; through frequent visits of our own; and through other channels so that we are in a position to know when and where industrial hygiene surveys are needed.

Medical vs. Engineering Program

TO MANY people, it is not at all clear where the industrial hygiene medical program ends and the industrial hygiene engineering program starts, in other words, the difference between the medical and engineering parts of the whole program. This differentiation is very simple if we remember that the medical program is concerned with the worker whereas the engineering program is concerned with the working environment. The medical services have to do with (1) the placement of the worker, that is, putting the proper worker on the job, and (2) keeping the workers on the job by (a) routine physical check ups, (b) early treatment or transfer of workers showing signs of illness of any kind, (c) supervising nutrition and personal hygiene, and (d) promoting plant and community welfare. The engineering services have to do with (1) the appraisal of the health hazards, and (2) the removal of the health hazards from the workers. Even though there are variations in the industrial hygiene programs from plant to plant and the degree of compliance with minimum standards varies greatly the program in common use is briefly as follows:

Engineering Services

AS INDICATED previously, the engineering services are concerned with the appraisal of the health hazards and the removal of such hazards from the workers. Whether the engineering control measures are good or not will be reflected in the medical department records. If the atmospheric contamination is maintained at a low level the frequency of early cases of poisoning and transfers will be few. If, on the other hand, the degree of atmospheric contamination from toxic substances is high early symptoms of poisoning will occur frequently and many transfers to other jobs will be necessary.

DETERMINING THE HAZARDS: It cannot be denied that the proof of the working conditions is to be found in the medical findings. However, experience has shown that many toxic contaminants produce symptoms of chronic poisoning only after considerable periods of exposure and frequently after irreparable damage has been done to the workers. Also, experience has shown that the frequency of occupational illnesses from any atmospheric contaminant is essentially nil if the degree of contamination is kept at an appropriately low level commonly called the maximum allowable concentration which varies tremendously from substance to substance. Hence by using the maximum allowable concentration as a yard stick, the chemist or engineer can appraise the potential health hazard of any operation and if it is found to be of concern, the engineer can take the steps necessary to reduce the degree of contamination in the atmosphere to a safe level.

This procedure has been and is being followed in the Army explosives manufacturing and processing plants. The industrial hygiene surveys of the Public Health Service and the Army Industrial Hygiene Laboratory in the plants under consideration revealed early which operations in the various industries presented important health hazards.[4] Recommendations for the control of such hazards were and still are included in all reports. These recommendations are not guesses or new ideas as a rule but consist largely of practices and measures which have been employed in other industries and which have been shown to stand the test of time. The recommendations are made by trained, and in most instances, experienced engineers who have had the benefit of much experience in similar work before the war.

Let us review briefly some of the more important operations in these industries which were uncovered by the health hazard appraisal studies of our industrial hygiene surveys. The following tables present in outline form the important health hazards and recommended control procedures in the three types of explosives manufacturing and loading industries which present the majority of the health hazards, particularly those which result in chronic poisoning.

In addition to the industries and operations listed in the tables, the following deserve mention.

1. Nitrogen oxides are encountered in the acid areas of some of our plants such as smokeless powder manufacture, TNT and DNT manufacture, tetryl manufacture, and ammonium nitrate and ammonium picrate manufacture. As a rule, however, exposure to this contaminant is accidental and results in acute rather than chronic illness. Most operations connected with the handling of nitric acid or nitrogen oxides are enclosed and exhaust ventilated so that significant exposures occur only in the case of a failure of some part of the equipment or the process. Similarly in some of the manufacturing plants infrequent exposures to very high concentrations of carbon monox-

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ide, hydrogen sulfide or ammonia occur by accident. While such exposures are serious they are of relatively little concern to the industrial hygiene engineer since the solution is obviously one of maintenance of equipment, education of worker, and providing appropriate respiratory protective devices.

2. The manufacture of smokeless powder involves the use of large quantities of ether and alcohol. Even though most operations involving the solvent are enclosed and exhaust ventilated some high atmospheric concentrations of ether-alcohol vapors occur at one or two operations. Such exposures can be and are being reduced by appropriate local exhaust ventilation.

As indicated previously, the proof of the pudding is in the eating, that is, whether or not an actual health hazard exists can be determined only by the influence upon the worker's health. This must always be borne in mind. However, at present when there is so much discussion, pro and con, about the value of appraising health hazards by determining the worker's exposure, it may be well to point out that our experience has always indicated that such appraisals are correct in a large majority of instances if made by experienced personnel employing approved methods. For example, our record in the plants under discussion has been somewhat as follows:

1. The predictions made as a result of the engineering appraisal of the workers' exposures have been found by medical records over a period of time to be accurate for operations involving TNT, DNT, ammonium nitrate, lead and a host of other substances. The predictions on TNT and DNT were made before medical evidence was available in our plants—the medical records now available substantiate the engineering conclusions.

2. Our predictions on ether-alcohol vapors have not been borne out. This was not owing to any error in the determination of the workers' exposures but to the lack of concrete knowledge on the toxicity of ether and alcohol vapors. We were guided by the value of 400 ppm. then under consideration as a maximum allowable concentration for ether-alcohol vapors and on this basis predicted occupational illness among the exposed workers. To date these predictions have not been borne out by the medical findings and as a result the proposed value of 400 ppm. for ether-alcohol vapors has not been established. In fact no value is being accepted until more concrete information is available.

3. At one other operation, owing to unusual circumstances, no significant health hazard was found to exist by the engineering appraisal. However, the routine medical examination showed the existence of a health hazard which has since been substantiated by the engineering appraisal. The real reason for missing this exposure was that an extremely small amount of a more or less secret material was handled and owing to its secret nature and small amount as compared to the larger relative volume of other less toxic materials, it was not given a second thought in the engineering appraisal.

It is therefore readily apparent when consideration is given to the few "misses" and the comparatively numerous "hits" that proper engineering appraisal of health hazards is of great value.

Let us not, however, confuse the meaning of the term "the engineering appraisal of health hazards." This does not mean that, when the exposure of workers exceeds the maximum allowable concentration of a given atmospheric contaminant, all those operators will sooner or later become ill, or contrariwise that no workers will become ill if the exposure is kept slightly below the maximum allowable concentration. We are not dealing with machines or robots but with physiological organisms so that some of the less resistant will be affected adversely by exposures well below the maximum allowable concentrations and many of the more resistant will be unaffected by exposures much above these allowable concentrations. The maximum allowable concentration is nothing other than that concentration which is not harmful to the large majority of normal individuals. Obviously, the higher the exposure the greater will be the percentage of workers affected adversely, and the lower the exposure, the less will be the incidence of illness among the exposed workers. You may well say "that being so why not reduce the exposure to a value so that no normal individual will be affected adversely." Therein lies the "rub," for it is frequently uneconomical, impracticable, or even impossible to reduce the exposures of some substances, or at some operations, to such a low value. Furthermore, it is unnecessary in most instances, since the routine medical examinations will reveal most illnesses in their early and curable stages, thereby preventing irreparable damage or fatalities.

It does not follow, however, that all engineering appraisals of health hazards are of value. Our experience indicates that where untrained chemists or engineers are assigned by plant management to evaluate the health hazards many of the results and conclusions derived therefrom are not only erroneous but also dangerous. The novice in this work with but rare exception seems to be possessed with the desire first to hunt dust or other contamination whether any workers are actually breathing that air or not, and second to sample only while the workers are engaged in the parts of their operation producing the highest exposure. These errors seem to be so obvious that it is difficult to believe that they are extremely common. Our experience in this connection has been so one-sided that we have no confidence in the results obtained by perfectly good chemists or engineers unless they have had appropriate training and practical field experience in proper sampling techniques.

CONTROLLING THE HAZARDS: We come now to the second phase of the engineering program, the control of atmospheric health hazards. Such hazards may be controlled by (1) substitution of less toxic materials, (2) isolation, segregation or enclosure of the offending operations, (3) dilution with uncontaminated air, and (4) control of the contaminant at the point of dissemination usually by local exhaust ventilation. Of these methods, the last, local exhaust ventilation, is the most important in our plants.

However, the application of local exhaust ventilation has been very slow and has met much opposition from many sources. There were obviously many reasons for proceeding cautiously but the opposition was owing largely to the fact that the fundamental principles of, and the recent advances in, the application of local exhaust ventilation were not understood. Those systems which are in existence in these plants, in many instances, did not do the job, and, in other instances, they presented serious explosive hazards, so that there was tremendous reluctance to permit their use for controlling TNT, tetryl, and other explosive dusts, fumes or vapors.

The conditions which present most of the unusual problems in our plants are (1) the explosive nature of the atmospheric contaminants; (2) the nature and location of many of the buildings housing the operations; and (3) the nature of the operations. A study of these problems by our survey personnel led to

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the conclusion that local exhaust ventilation systems for these plants must fulfill the following requirements if they are to be acceptable from both the industrial hygiene and safety viewpoints; (1) they must contain positive type exhausters such as centrifugal fans; (2) they must prevent the accumulation of explosive materials in the ducts and exhausters; (3) they must permit routine cleaning operations; (4) they must present a minimum of projection on the inside surfaces for the collection of the explosive contaminants and (5) they must be properly grounded. The key to fulfilling these requirements centers on (2), since if it is met adequately the others are minimized and present no serious problems. Careful consideration of this requirement indicated that it could be accomplished either by locating an efficient collector (preferably wet) close to each hood, or by keeping the inside surfaces of all ducts wet and wetting down the contaminant as well as possible by means of sprays.

Both of these systems have been tried and have been found to operate with complete satisfaction from all points of view. The first type to be installed was that in which the inside surfaces of the ducts are kept wet at all times, but the type employing industrial wet collectors close to the hoods is the more common.

In the first type the design is exactly the same as any local exhaust ventilation system except that all ducts slope downward, and spray heads are located in all hoods and throughout the ducts. The sprays are so spaced that all the interior surfaces of the ducts are kept wet and one spray is located at the exhauster, a centrifugal type fan, so that the entire interior of the fan is kept wet at all times. Some of the spray heads are directed with and some against the air stream. Even though these systems do not contain collectors as such, the water sprays serve to remove a considerable percentage of the larger particles from the air. As stated previously the ducts slope downward and contain a "Y" in a vertical plane at the low point of the duct system and outside of the building. The lower branch of the "Y" is immersed in water in a large sump and the upper branch leads to the fan. Consequently, the water from the sprays drains into the sump and is recirculated by means of a pump. Most of the contaminant settles in the sump which is cleaned once a week. A substantial amount of contaminant is recovered from the sumps and in some instances is re-used after it has been re-processed. The water pump and exhauster are so inter-connected that the exhauster cannot be turned on unless the water pump is

TABLE OF IMPORTANT ATMOSPHERIC HEALTH HAZARDS AND RECOMMENDED CONTROL MEASURES BY TYPE OF ESTABLISHMENT

Operation	Nature of Exposure	Degree of Exposure	Recommended Control Measures
Screening	TNT dust. Infrequent to continuous.	Severe	Enclose operations. Provide local exhaust ventilation at minimum rate of Q=300 A. Respirators needed if control is not adequate. (Q represents rate of air removal in cubic feet per minute.) (A represents effective area of hood opening in square feet.)
Melting	TNT dust, fume and vapor. Intermittent. Few workers.	Slight	Provide exhaust ventilation at minimum rate of Q=150A. (A represents area of one lid or door.)
Draw off	TNT fume and vapor. Few workers direct, many indirect.	Moderate but usually intermittent	For infrequent operations—Respirators. For frequent operations—Room ventilation and respirators or local exhaust ventilation—Q about 200 c.f.m.
TNT cooling	TNT fume and vapor. Few to many workers. Intermittent to continuous.	Slight to severe	Mechanical agitation. Respirators for infrequent exposures. Adequate room ventilation and respirators, or preferably local exhaust ventilation at kettles (Q=120A for continuous exposures). (A represents area of top of kettle.)
Pouring	TNT dust, fume and vapor. Many workers. More or less continuous.	Slight to moderate	Careful filling and puddling. Elimination of all unnecessary sources of atmospheric contamination. Good general ventilation. Rotation of workers. Respirators.
Bomb filling (Draw off)	TNT fume and vapor. Few workers. Intermittent.	Slight to severe	Have valve operator stand to side of bomb and remove fumes from room. Local exhaust ventilation—Q about 200 c.f.m. per draw off site.
Bomb puddling; nose and tail pouring	TNT dust, fume and vapor. Many workers. Intermittent to continuous.	Slight to moderate	Same as pouring.
Adding TNT scrap	Same as above	Moderate to severe	Careful handling of scrap. Good general ventilation. Clean gloves. Rotation of workers. Respirators.
Booster cavity drilling or reaming and thread cleaning	TNT dust. Few to many workers. Intermittent to continuous.	Slight to severe	Eliminate deep drilling. Apply suction during entire cycle, or local exhaust ventilation.
Riser knock off	TNT dust. Few to many workers. Intermittent to continuous.	Slight to moderate	Employ risers of good design. Use care in knocking risers off. Isolate and exhaust ventilate if possible.
Riser break out	TNT dust. Few direct, many indirect. Usually intermittent.	Moderate to severe	Exhaust hood or booth similar to spray paint booth. Ventilation rate—Q=300 A.
TNT scrap Break up	TNT dust. Few direct, many indirect. Essentially continuous.	Moderate to severe	Different method of scrap production, or exhaust hood or booth similar to spray paint booth. Ventilation rate—Q=300A.
Tubs and buckets break out	TNT dust. Few direct, many indirect. Intermittent.	Moderate to severe	Exhaust hood or booth similar to spray paint brush. Ventilation rate—Q=300A—or isolate operation and have workers wear respirators.
Flaking or graining	TNT fume and dust.	Insignificant to moderate	Enclose process as much as possible and exhaust ventilate at minimum rate of Q=150A.
Box filling	TNT dust. Few workers.	Slight to severe	Provide local exhaust ventilation at source of dust through hood formed of shrouded flange at end of chute. Q=200A.
Box shaking	TNT dust. Few workers.	Slight to severe	Provide local exhaust ventilation at source of dust through hood of same shape as for box filling. Minimum ventilation rate Q=200A.

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LOADING PLANTS—TETRYL

Operation	Nature of Exposure	Degree of Exposure	Recommended Control Measures
Screening, blending, canning	Tetryl dust. Few workers. Intermittent.	Moderate	Enclosure and respirators.
Pelleting (Charging hoppers)	Tetryl dust. Few to many workers. Intermittent.	Moderate	Respirators.
Pellet alignment	Tetryl dust. Few workers. Continuous.	Moderate	Downdraft exhaust ventilation through grille top work benches or slotted alignment trays. Q = 200A. Partial enclosure also.
Cup loading	Tetryl dust. Few to many workers. Continuous.	Moderate to severe	Downdraft exhaust ventilation through grille top work benches or screen or perforated bottom trays. Q = 200A. Partial enclosure also.
Tube loading	Same	Same	Downdraft exhaust ventilation through grille top work benches or slotted or screen bottom trays. Q = 200A. Partial enclosure also.

MAINTENANCE AND MISCELLANEOUS

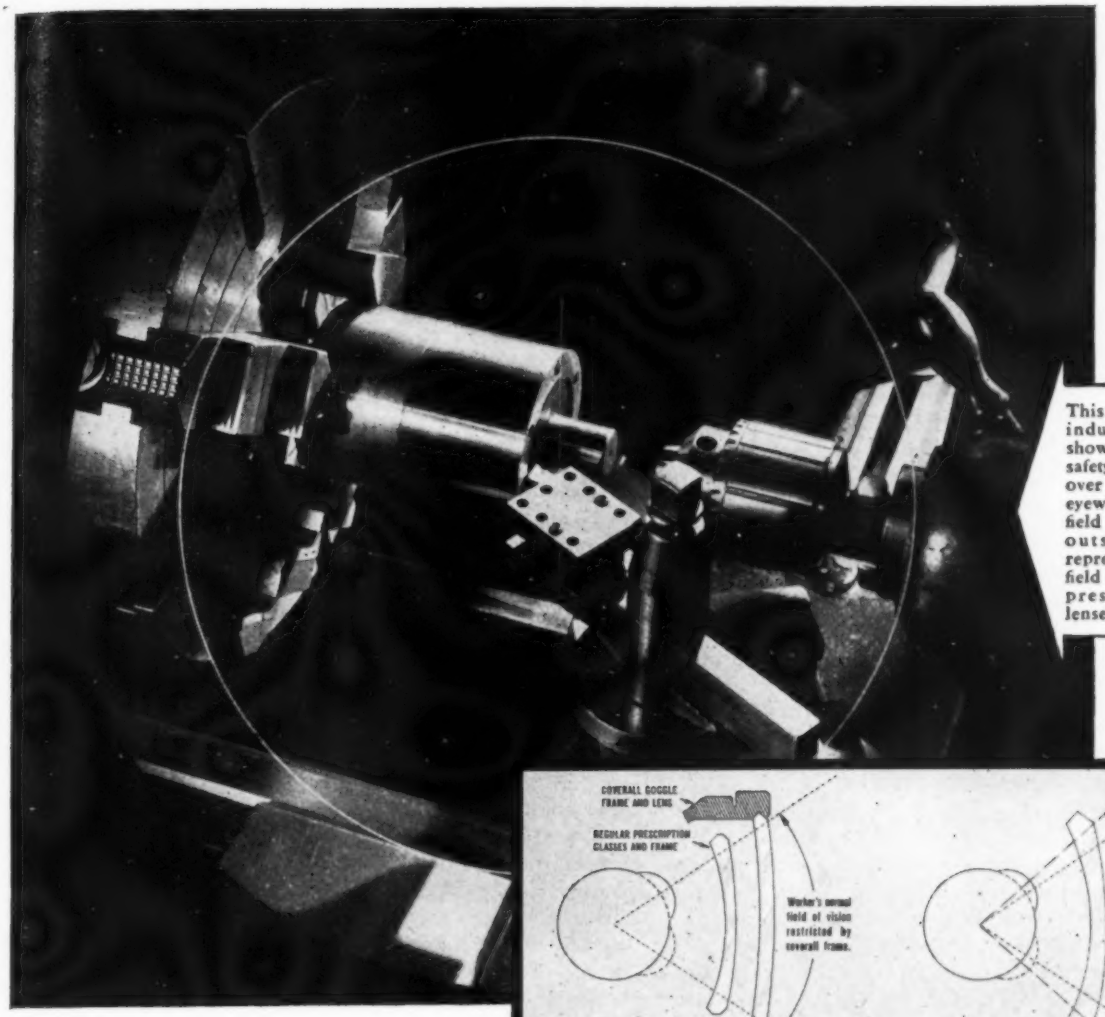
Operation	Nature of Exposure	Degree of Exposure	Recommended Control Measures
Spray painting	Paint pigment and thinner. Few workers. Intermittent to continuous exposure.	Slight to severe	Exhaust ventilated booths for routine work. Q = 200A. Supplied-air respirators for intermittent or repair work.
Welding	Metal oxide fumes and nitrogen oxide gases. Few to many workers. Intermittent to continuous exposure.	Slight to severe	Local exhaust ventilation at each routine welding site. Q = 350 cfm. Good general ventilation for occasional work.
Degreasing	Toxic vapors from organic solvents. Few workers direct, usually, sometimes many indirect. Intermittent to continuous exposure.	Slight to severe	Proper tanks, vats or containers. Proper operation of tanks and control measures. Slow rate of withdrawal of parts. Control of solvent from cleaned parts. Enclosures. Local exhaust ventilation. Q = 50 LW. Good general ventilation. (L and W represent tank length and width respectively in feet.)
Electroplating	Acid gases and mists. Few workers usually. Exposure intermittent as a rule.	Slight to severe	Enclosure and exhaust ventilation. Local exhaust ventilation. Q = 120 LW. Good general ventilation for infrequent, short operation.
Metallizing	Metal oxides and carbon monoxide. Few workers. Exposure usually intermittent.	Slight to severe	Exhaust ventilated booths for routine work. Q = 200A. Supplied-air respirators for intermittent or repair work.
Luminous dial painting	Harmful radiation, dust and gas. Usually few workers. Often continuous.	Moderate to severe	Small quantities of radioactive substance only permitted near workers. Personal hygiene. Local exhaust ventilation. Q = 50A.

on also. Consequently, the explosive dust cannot be conveyed through dry ducts and through a dry fan at any time. This type of installation is relatively inexpensive but requires considerable maintenance. Nevertheless, it is particularly well adapted to our plants since most of these plants will cease operation at the close of the war and it is therefore undesirable to invest more money in equipment than is necessary.

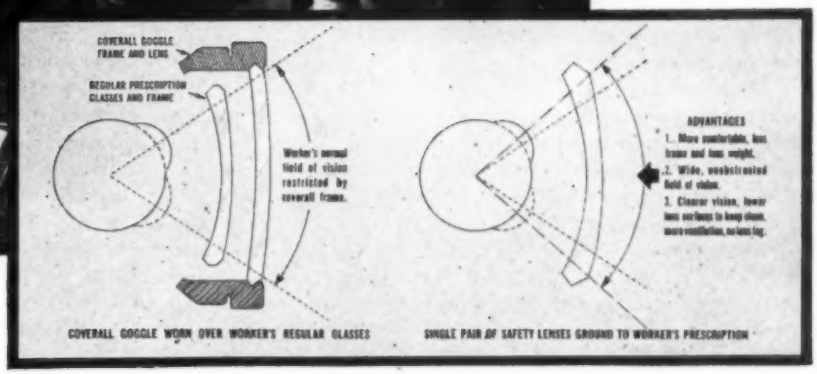
The other type of local exhaust ventilation system is no different from conventional systems except that the collectors (usually industrial wet collectors) are located adjacent to, or as close as possible to, the exhaust hoods so that the contaminant is removed from the exhausted air before it is conveyed through any substantial lengths of ducts. Dry collectors may be used only where the operation performed at or in the hood is such that a spark or detonation is highly improbable. It must be stressed, of course, that wet collectors are preferred and the dry collectors exist more or less under protest. Where wet collectors are used, the water supply and blower are so interconnected that the blower cannot be operated unless the water is turned on also.

Another condition which presented new problems in this work is the size and location of many of the buildings housing the operations needing control measures. A fair percentage of the buildings in loading plants are small, of one room and usually one story type, within which only one operation is conducted. Others are larger but are divided into separate one room bays by means of barricades. The buildings are generally separated one from the other by considerable distances and many of the plants are located in flat, open terrain so that air movement is unobstructed. Consequently, in summer when the doors are open strong breezes are the rule through the buildings and the control velocities produced by local exhaust ventilation systems must be adequate to overcome the interference created by the natural air movements. Where the equipment requiring control measures is located near open windows natural air velocities as high as 1000 f.p.m. have been experienced on windy days. Therefore, the control velocities normally recommended for similar operations are inadequate in these plants and a minimum control velocity of 350 f.p.m. has been found necessary unless the source of contamination is protected by shields, barricades, or equipment. The individual rooms or bays usually house only a single operation which seldom presents more than two or three major sources of contamination, consequently, the unit system with hoods and collectors at the several sources of contamination tied to a common exhauster located outside the building provides a satisfactory solution.

Many, if not most, of the operations in these plants require the attendance or exposure of only relatively few workers, so that it is sometimes difficult to justify the expenditure necessary for the installation of properly designed local exhaust ventilation systems. Consequently, many of the operations involving excessive atmospheric contamination are enclosed as much as possible, the operators at these jobs are rotated to other jobs involving less or no exposure, and respirators are required for the high exposures to avoid the relatively expensive procedure of installing local exhaust ventilation.



This photo of a typical industrial operation shows how cover all safety goggles, worn over worker's regular eyewear, narrow his field of vision. Area outside white line represents unrestricted field of vision through prescription safety lenses.


COVERALL GOGGLE FRAME AND LENS
REGULAR PRESCRIPTION GLASSES AND FRAME
Worker's normal field of vision restricted by coverall frame.
ADVANTAGES
COVERALL GOGGLE WORN OVER WORKER'S REGULAR GLASSES
SINGLE PAIR OF SAFETY LENSES GROUND TO WORKER'S PRESCRIPTION

Wide Angle Vision Means Wide Angle Efficiency with Greater Safety

Prescription Safety Lenses Provide Unrestricted Vision Plus Safety Against Impact

The worker whose eyes can see only a small portion of his work at one time cannot contribute his maximum effort to production . . . and he is constantly exposed to unseen hazards outside his restricted field of vision.

Protective coverall goggles, worn over the worker's regular eyewear, narrow the field of vision . . . although they do provide a convenient method of protecting the eyes of those employees or executives who are only occasionally exposed to eyesight hazards.

On the other hand, prescription ground impact-resistant lenses, professionally prescribed to the visual requirements of the job, and mounted in a spectacle type metal safety frame, provide the wide-angle vision of a worker's regular eyewear . . . plus maximum protection on the job. Workers can wear prescription safety glasses (with either single vision or bifocal lenses) with comfort and convenience comparable to their regular glasses.

To supplement your safety program, send for details and descriptions of B&L safety eyewear for all types of eye-hazardous jobs. Write Bausch & Lomb Optical Company, 602 St. Paul St., Rochester, New York.

BAUSCH & LOMB

Safety Eyewear

Some of the exposures, even though they are severe and would lend themselves well to control by local exhaust ventilation, are intermittent and of short duration. Therefore, the use of respirators during the periods of exposure appeared to be the most feasible, and certainly the most economical, control method. However, this introduced a new health problem since most of the materials handled in these operations are severe dermatitis producers and the influence of dermatitis on the faces of the wearers where the respirators came in contact was very high.[4] This problem was overcome for the greater part by the use of facelets on the respirators and the frequent renewal thereof (sometimes as often as four times daily); by exceptional personal hygiene; and by appropriate protective creams. On the other hand, where intermittent exposures to high concentrations of TNT were involved, an additional complication arose since TNT is known to be absorbed through the skin.[5] While respirators would effectively prevent the inhalation of TNT during intermittent exposure to even high concentrations, the exposed surfaces of the workers' bodies and their uniforms were found to be covered with a layer of TNT only a few minutes after beginning work at these operations. Adequate control of the contaminant by means of local exhaust ventilation would reduce tremendously the amount of TNT depositing on the worker and decrease the skin absorption considerably. Therefore, each operation at each plant was found to require individual study to arrive at the most satisfactory solution.

Numerous specific instances might be cited to demonstrate unusual problems encountered in our plants but suffice it to say that all working environments can be made safe as regards the atmospheric contamination. As indicated previously each different operation or exposure requires individual study if the best control measures, that is the most efficient and the most economical, are to be devised. We have not encountered any problems in engineering control which we were unable to solve. This does not mean that all exposures in our plants have been controlled for they have not because our greatest problem, which we are just now overcoming, has been the education of the many people having a "finger in the pie" that atmospheric contamination can be reduced economically and safely to satisfactory levels by well designed engineering control measures.

Results Obtained

A FEW of the more important examples of reduction in atmospheric contamination will be mentioned to give you some idea of the tremendous improvement effected in the working environment. At screening operations where the workers' exposure to atmospheric contamination were of the order of 10 to 60 times the maximum allowable concentration without control, the exposures with local exhaust ventilation systems designed by our engineers were of the order of 1/5 to 1/3 of the maximum allowable concentration. In a cupping operation a reduction from two to 10 times the recommended maximum level to only a trace in the atmosphere was effected. At a canning operation the atmospheric concentration of the contaminant was reduced from about 20 times the maximum allowable concentration to slightly below this value by a very inexpensive installation. In another plant a similar installation reduced the exposure at a box filling operation from a level of two to four times the maximum allowable concentration to about 1/3 of this value.

Much remains to be desired as regards the engineering control of atmospheric contamination. However, a very active program is now in progress and the effect upon the future medical records will be very interesting (a preliminary report from one plant gives results "too good to be true"). The records up to September of last year indicate that the medical program in our industries was excellent but that the engineering program needed much improvement. For example, the medical records of workers exposed to TNT reveal that for the first 93,000 man years of exposure, there were only eight fatalities attributable to TNT, 241 lost time cases of poisoning, but about 5000 cases of early symptoms of TNT poisoning which resulted in an average of 375 transferrals to other jobs per month. These results indicate that the workers are being affected adversely—that is, excessive exposure—but that the affected workers are being detected by frequent periodical physical examinations and removed from the exposure, in other words, a good medical program. However, the record thus far in this war is much better than during the last war when 475 deaths out of 17,000 cases of TNT poisoning were reported for 7½ months operation.[6]

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Memorial Issue

THE JUNE, 1944 issue of the *Rocky Mountain Medical Journal* was designated as "DONALD E. CUMMINGS Memorial Number."

A brief editorial sketch of the life of DONALD E. CUMMINGS by JAMES J. WARING, M.D. is followed by an excellent portrait photograph, a bibliography of published papers, and also a most important article by MR. CUMMINGS on "The Coordination of Industrial Hygiene Instruction with Other Clinical Training."

The other articles in the issue are "Tuberculosis and War Industry," by DR. W. P. SHEPARD; "Elements of Diagnosis and Prognosis in Pneumoconiosis," by DR. LEROY U. GARDNER; "A Review of Silicosis for the Industrial Hygienist and Medical Practitioner," by DR. L. E. HAMLIN; "The Physician's Responsibility in Compensation Law Administration," by MR. B. E. KUECHLE; "Benzene (Benzol) Poisoning, Report of a Fatal Case with Autopsy Findings," by DRS. ROSCOE H. ACKERLY and GARFIELD H. HAWLICK; and "Management of the Silicotic Patient," by DR. PAUL J. BAMBERGER.

No one who knew DON CUMMINGS and his energetic mind could fail to recognize that he was able to see fundamentals easily and to rapidly put them into practice. His article on the subject mentioned above is a very good example of this principle, from which a few quotes can be given, as follows:

"Industrial hygiene physicians are differentiated from physicians or surgeons engaged in caring for the ordinary ills and hurts of industrial workers in much the same manner as health officers are distinguished from private practitioners of medicine in the average community. . . . Without doubt, the primary requirements for satisfactory industrial hygiene training will be discharged only when industry is represented in the class rooms and clinics of the teaching hospital by an instructor possessing an intimate understanding of, and sincere devotion to, its peculiar health problems."

"Specialists in industrial hygiene should participate regularly in ward walks, appropriate medical clinics,

"HEY! WATCH IT BUD!"

"GAS," HEARTBURN, UPSET STOMACH "NERVOUS INDIGESTION"—such gastric upsets sabotage even the best worker.

PROMPT RELIEF in these cases of stomach distress due to excess gastric acid is certainly what's needed!

BiSoDoL DOES IT! In many cases you'll find BiSoDoL brings *quick*, soothing relief . . . puts 'em back on the job in a hurry.

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POWDER OR MINTS

FREE TO INDUSTRIAL PHYSICIANS!

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Please send me FREE a trial size of BiSoDoL powder

DR._____

COMPANY_____

ADDRESS_____

roentgenological and clinical-pathological conferences so that both staff and students may study a patient in relation to his working environment with as much interest as is attached to the manifestations of disease. In many hospitals where teaching otherwise is excellent, the significance of industrial influences on such common diseases as pneumonia, tuberculosis and degenerative disorders frequently is overlooked completely."

DONALD E. CUMMINGS, although not a graduate physician had mastered an astonishing fund of medical information which was invaluable in supplementing his engineering knowledge and experience. On the basis of this, he had established an industrial hygiene division in the department of medicine of the School of Medicine of the University of Colorado, which ultimately under his direction would have become one of the foremost institutions in the country in the coordination of industrial hygiene instruction with other clinical training.

—C. O. SAPPINGTON, M.D., DR.P.H.

NURSING Aspects of Eye Care in Industry" will be the principal topic discussed at a conference of industrial nursing consultants and supervisors which is scheduled to be held in New York City on October 1 and 2, just before the opening of the Second Wartime Conference and 73rd Annual Meeting of the American Public Health Association. MISS ELEANOR W. MUMFORD, R.N., Associate for Nursing Activities, National Society for the Prevention of Blindness, will serve as discussion leader. Attendance will be limited to the first 50 registrations received from industrial nursing consultants and supervisors or instructors of university courses in industrial nursing. Anyone who wishes further details and may be interested in participating in this conference should write, as soon as possible, to MISS ANNA FILLMORE, R.N., 262 Madison Avenue, New York 16, New York.

IT IS AN interesting fact that no wars of significance have ever been waged over medical problems. People have fought over about every other problem imaginable. Wars over religion, over commerce, trade and industry, over boundaries, over races and sects, over royal and legal decrees, over social and economic questions but never over medicine. In fact, medicine has been throughout the centuries one of the great unifying agencies to bring the peoples of the earth together.

—DAVID J. DAVIS, M.D.

Examination for Painful Back Cases

EMPLOYEE'S NAME_____ E. NO._____ DATE_____

Please fill out this form when case is first seen and attach to record. Cross out words not wanted. Underline words to be stressed. Indicate degree as 1, 2, 3 4+ or ?

M. E. Lowell, M. D.

HISTORY—Type of work_____

Onset: Sudden ( ) Slow ( ) Duration Temperature

Result of: Accident ( ) Occupation ( ) Sickness ( )

Any upper respiratory condition? (yes, no) Any associated injury? (yes, no)

History of present condition_____

History of previous back injury or pain_____

STANDING

POSTURE—List? L ( ) R ( ) Abnormal spinal curvature yes, no) Limp (yes, no)

SITE—

Tenderness.....T

Pain.....P MARK

Muscle Spasm.....S FIGURE

Sciatic, gluteal or referred nerve pain.

PAIN WITH or LIMITATION OF MOTION—Forward ( )

Backward ( ) Lateral ( ) Rotary ( )

BED

SUPINE EXAMINATION—Leg shortening? L ( ) R ( )

Atrophy? L ( ) R ( ) Tenseness fascia lata? L ( ) R ( )

Pain on straight leg raising? L ( ) R ( )

Areas numbness? Legs—trunk L ( ) R ( )

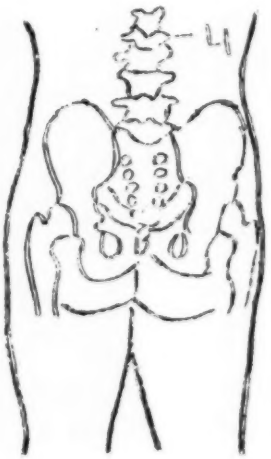
Other orthopedic defects?

PRONE EXAMINATION—Site of tenderness same? (yes,no)

Persistence of deviation of spine? (yes, no)

Hyperextension of leg and rotating—hip pathology? (yes, no)

Back pain made worse? (yes, no)



SITTING

K. J. (normal, abnormal) A. J. (normal, abnormal) Flat feet? (yes, no)

FOCAL INFECTION—Teeth ( ) Throat ( ) Prostate ( ) Pelvic ( )

X-RAY—Routine lumbar spine & pelvis low back pain cases ( )

Other x-rays spine ( )

Dental x-rays ( )

LABORATORY WORK—CBC ( ) SED. R. ( )

B. WASS. ( ) URINE ( )

DR._____

FINAL NOTE

Date closed:_____

Final Diagnosis:_____

Length of Disability_____

Regular work ( ) or Work Limitation ( )

X-Rays of spine normal ( ) Abnormality was_____

Stenosing Tendovaginitis

NATHAN MEADOFF, M.D., and A. BERNARD GRAY, M.D., Department of Orthopedics, Permanente Hospitals, in *Permanente Foundation Medical Bulletin*, July, 1944 (2:3, 106-111). Extract: "Prevention of stenosing tendovaginitis is especially important from an industrial standpoint. Our first cases came to us from the welding schools and it was there that the problem of prevention was first approached. A larger welding 'stinger' prevented some of the acute flexion of the fingers and afforded considerable benefit. Periodic finger relaxing exercises were instituted. The most important factor was the tension with which the new worker approached his welding. It was found that the average new worker was holding his welding 'stinger' far too tightly and exerting too much energy at the job. When tension was overcome by proper education, the instructors and leadermen noted a greatly decreased incidence of hand discomfort in their welders and associated craftsmen. Each case when first seen was treated by splinting to diminish tendon excursion. It was found sufficient to immobilize in extension the proximal interphalangeal joint only, as this would relieve locking in every case without interfering too much with the patient's work. Short metal padded splints were used which could be removed by the patient after work and be reapplied before returning. Surgical treatment was recommended for each case when symptoms persisted after three to four weeks after splinting. Those who did not wish to accept surgery were advised to make some occupational change. Cases were operated under local infiltration anesthesia, using a short transverse incision along the distal palmar crease. In each case the volar aspect of the constricted portion of the sheath was incised, and in only one case was it found necessary to also resect an elliptical area from the nodule. In DeQuervain's disease a simple resection of the roof of the sheath was adequate in each case and the thumb and waist splinted for one week."

Examination Form

THE accompanying history form for the examination of painful low back cases was developed by DR. M. E. LOWELL, for use at the Western Electric Company hospital at Kearny, New Jersey. Believing that the newer doctors in industrial medicine are too prone to carry over the "sacroiliac sprain" from private practice, DR. LOWELL says: "They did not make a comprehensive examination and, therefore, the nature of some of these low back cases was not recognized until treatment had been given for some time without results."

SKIRMISH
ON THE HOME FRONT

JOE MASON was a casualty as sure as any man who fought in the combat zone. At least, until Dr. Sampson got him under his x-ray. Then it was found that Joe's shoulder wasn't broken . . . that in a day or two he could go back to his machine . . . continue turning out weapons to help win the war.

The doctor on the home front is on a battle front every day. And thanks to the progressive march of science, he is well armed to fight the ills that face men behind the lines.

Consider x-ray . . . the modern weapon of scientific medical warfare. Fluoroscopy and the radiograph reveal the character of the "enemy" . . . show his position and indicate how best to combat him. They remove doubt and uncertainty. They show whether a "fighter" can go back to work and indicate a course of action that will put him back into fighting trim faster.

★ ★ ★

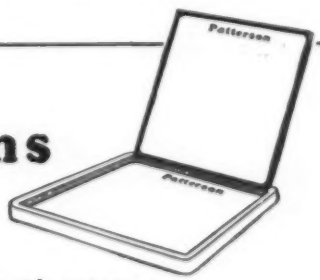
Sharp, contrasty radiographs are dependent on proper care of intensifying screens. Dirty, scratched, or stained screens increase exposure time, produce faulty results and frequently waste costly film. Screens should be examined periodically and those that are worn or damaged should be replaced promptly.

When selecting screens, remember Patterson intensifying and fluoroscopic screens have contributed steadily to x-ray procedure for the past 27 years. Today they are accepted as the standard of dependable screen quality. Patterson Screen Division of E. I. du Pont de Nemours & Co. (Inc.), Towanda, Pa.

DU PONT

Patterson Screens

Light the paths of X-Ray



Better Things for Better Living . . . *Through Chemistry*

INDUSTRIAL HEALTH and DISEASE

Suggested Pregnancy Adjustment Plan

—For Women in Industry—

CAROLINE G. OLSEN, R.N.

IN MAKING hygienic surveys of industrial plants for the purpose of inquiring into the working conditions of employed women, the writer learned that, with the exception of a very few plants, no study had been made by industrial organizations of the relation of pregnancy to the efficiency of the industry, nor had any program in the several plants visited been organized based on accurate details of the observation of the conditions arising from the pregnancy of its women employees.

National Safety News, February 1, 1944, (Vol. 49, No. 2, page 32.)

If complete records had been kept in the first aid one was in a position to get the case load reporting on each eight-hour shift and in some instances reporting a breakdown of the types of injuries and the number of non-occupational cases reporting, but with the exception of a very few plants there were no records available as to how many, if any, women in the plant were pregnant. One plant visited hires pregnant women and the doctor places them on suitable work requesting them to report regularly, but, as to the women already in the plant, no plan was set up to encourage these women to report to the first aid in the event of pregnancy.

The suggestions incorporated in the following pregnancy protective program, therefore, represents the endeavor to create a general procedure applicable to all plants, yet capable of variations necessitated by local conditions, as the survey, based on my fundamental inquiry, revealed the facts that no organized study of this problem had been made, nor had any program been established for its control.

The general inquiry made to management as these conditions of lack of a control program became evident was: What cooperation, if any, is exercised in relation to the protection of the health of the pregnant women workers in your plant?

The various responses included such samples of fruitless procedure as the following:

1. Plants that were greatly opposed to the employment of the pregnant woman believed they had a protective policy if they "fired" them when pregnancy was evident.
2. Others based their protective plan upon the termination of their employment at the fifth month.
3. There were organizations which relegated to their foremen the power of determining gestation by observation and reporting his suspicions to the management or to a woman counselor.

In some cases of this type of detection the women were putting on weight, since they were living more regular hours, as well as patronizing the canteen wagon on its rounds,—they were getting fat instead of getting babies; they were embarrassed and indignant about such a procedure by management which, thereby, had created an additional grievance to adjust with labor.

Medical authorities are agreed that the first three months is the period of hazard, yet most women employees, who wanted or needed work in plants where there is no pregnancy adjustment plan, do not report the pregnancy at this early stage and remain at their work. Consequently, the company, confronted with this situation has no control over this period of industrial hazard.

Medical authorities are further agreed that the second three months is comparatively the safest period of pregnancy, yet some plants have based their protection plan upon the termination of the employment of pregnant women at the fifth month; in others, management "fired" them when pregnancy was evident.

This inconsistency in control of pregnancy determines the necessity for establishing some form of protective policy or plan for the supervision of that particular group of employees now so greatly enlarged through the increasing demand for the employment of women. Management, for whom this demand has become an economic necessity, should recognize the urgent need of setting up an efficient, practical control over the adjustment of the pregnant woman to her conditions of work, and likewise control over the conditions of the work for pregnant woman.

These groups, therefore, had no constructive procedure by which the women were encouraged to report pregnancy and to avail themselves of opportunities for advice and adjustment or continuance of employment.

As the Alabama State Health Department points out: "Discharging a woman worker as soon as it is known that she is pregnant as many plants still do, even though she is physically capable of working several more months, means the complete loss of her services as well as the loss of the investment in developing her job skill. It is estimated that 'the new woman employee represents a substantial investment of time and training, estimated as high as $500.00 per worker in some plants.' The worry and strain of those who fear dismissal because of pregnancy are factors which seriously impair efficiency."

The health service in most plants includes good first aid, the employment of a plant physician, some hygienic program based on the work of state or local health agencies, often psychiatrists, personnel and recreation directors. The medical program should be expanded to include safeguards for the pregnant woman. The details of information for this expanded service should be collected, classified, and recorded, and a proper authority set up to control the resulting procedure.

One suggestion which has been well received is that in which the doctor in charge of first aid requests the woman to report pregnancy promptly to the first aid with a statement from her family physician, or from a clinic giving her due date and her physical condition, which may necessitate adjustments in her type of work; for example, positional changes which might be injurious such as standing, lifting and stretching; and transfers to other types of

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As a throat spray or gargle
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West Durma-Gards Prove Effective...Meet Rigid Tests

Supplying workers with the right protective garments is recognized by safety engineers and industrial physicians as one of the most important means of helping to prevent the occurrence of industrial dermatitis.

It is important that the protective garments actually fulfill their function and meet rigid tests for impregnability and resistance to chemicals and other irritants.

Because they are made of a light strong base fabric treated on both sides with especially processed plastic, these garments definitely resist absorption, penetration or saturation of solvents, oils, acids and other materials commonly used in industry.

- **Resistant to Oils, Acids and Chemicals**
- **Resistant to dusts and powders**
- **Resist absorption. Withstand solvents**
- **Light in weight—comfortable—Adjustable arm guard sleeves for ventilation (fit any wrist)**
- **Washable in soap and water**

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Please send me further information on Durma-Guard.

Name..... Title.....

work which would lessen physical strain, likewise to reduce exposure to toxic substances. This cooperation between plant and personal medical advisers maintains the confidence of the employee and makes her amenable to whatever adjustment may be necessary to protect her and regulate her life. Pin a rose on the prospective mother, rather than condemn her as an undesirable employee.

Once a plant control is set up and a policy adopted, all women, married or single, should be informed of the procedure at the time of their employment. A printed copy of the plan, inserted in an envelope and marked "Personal," may be distributed to the employee by the nurse or personnel director, giving her instructions for procedure in the event of pregnancy. The following is a suggested form of such a policy:

PREGNANCY PLAN
To All Women Employees Who Are Now Married Or Who May Become Married During Their Employment With Us:

Dr. ....., in charge of our Medical Department, requests that each woman employee report promptly to the First Aid Department in the event of pregnancy.

You may continue working as long as it is considered safe by your family doctor, or by the doctor at the health agency or clinic to whom you report for care. A statement to that effect is required from your physician immediately in order that Management can cooperate with you and the Medical Department can cooperate with your personal physician to safeguard your health and the health of your child.

A form somewhat similar was observed in a plant in Rockford, Illinois.

Another devised the card (next column) which is a concise and constructive form of insert for distribution to women evolved from my outline of the "Procedure For Executing the Pregnancy Adjustment Plan."

With a well organized cooperative policy established in a plant[1] the industrial physician is in a position to recommend transfer to more suitable work, providing seniority and Union rules do not interfere, to acquaint the outside medical adviser with the hazards of the woman's employment, and to cooperate with him as to the termination of her employment.

As to the advisability of the continuation of the employment of the pregnant woman, opinions vary. Some opinions in regard to this matter of length of time of employment are as follows: [2]The United States Women's Bureau states that six weeks within full term is permissible, depending upon her physical condition and the suitability of her work. [3]The Council on Industrial Health of the American Medical Association among its essentials of medical service in industry recommends good correlation with the family physician, or obstetrician and gynecologist and other community health agencies for proper management of non-occupational sickness and injury.

The Preliminary Report of the Committee on the Health of Women in Industry of the Section on Obstetrics and Gynecology[4] states in its general recommendations that each pregnant employee should have individual consideration by her obstetrician and by the plant physician as to the hours and duration of the employment as well as to the type of employment.

ABOUT WORKING DURING PREGNANCY

PROMPT REPORTING of pregnancy is important to your own health and well-being as well as to the company in planning the work for which you are responsible.

YOUR PLANT NURSE will handle the records and details for you in the First Aid Department.

YOU MAY CONTINUE WORKING as long as it is considered safe by your family doctor, or by the clinic to whom you report for care. A statement from your personal physician will enable the company to cooperate with you and your physician to safeguard your health and the health of your child.

THE AMERICAN MEDICAL ASSOCIATION (Council on Industrial Health) recommends that pregnant employees should not work after the 32nd week of pregnancy (that is, within 6 weeks of term), and should not return to work until 6 weeks after the delivery. Her physician should send notice that she may return to the plant nurse.

FINANCIAL AID for the expenses of confinement is available, of course, to all employees enrolled under our Group Insurance Plan.

OPERADIO MANUFACTURING COMPANY

TO SUMMARIZE then, the procedure I suggest for executing the pregnancy plan is:

1. The Pregnancy Plan inserted in an envelope and marked PERSONAL is distributed to all women upon employment and by the use of a payroll insert to women already employed in the plant.

2. Management may arrange for the plant doctor to create an educational program and distribute instructions for following it to the women.

3. At the time the employee reports her pregnancy she is instructed to report to plant first aid periodically that they may be assured she is consulting her family physician. To promote the prompt reporting of pregnancy, it must be realized by both management and employee that the greatest benefits shall be derived from a leave of absence, not from a discharge.

4. An initial inspection of the woman's work is imperative in order that adjustments may be made if necessary. Periodic checks of the conditions of her work should follow.

5. The plant physician or the nurse should notify the family doctor or clinic if any evidence of irregularities occur at her work.

6. The recommendation for the termination of employment may be made by the plant physician or the family doctor.

Thus the responsibility for an industrial health program regarding the pregnant woman involves obligations for management and labor and medicine and the closest cooperation on the part of all. Management is lending refinement and consideration to the employees when the control of the policy is a personal matter between the individual and the plant doctor as suggested in the pregnancy plan, in contrast to the "firing," the arbitrary fifth month procedure, or the report of the foreman. Not only is management safeguarding their health but also is accumulating data on such allied industrial problems as absenteeism, turnover, child welfare, and others in relation to the employment of women. Quoting Dr. Randolph Ray, Rector of The Little Church Around the Corner in his article entitled 'For Better For Worse" in the March number of *Atlantic Monthly*: "The young mother who must support her child in war time—and long after, if her husband is killed or returns physically disabled—is faced with another problem. Many industries refuse to hire a pregnant woman, or dismiss her as soon as they discover the fact. She and her child then become, in spite of themselves, objects of charity."

That these relationships are being studied is evident in the enthusiasm with which suggestions for a plant policy for the pregnant woman is received. To state the effects of the acceptance of a plant policy definitely is premature at the present time, but it is an attempt to encourage the woman in industry to report pregnancy promptly and to cooperate in a plan for personal care and advice in the supplementary protection of the health of the women where such a plan exists.

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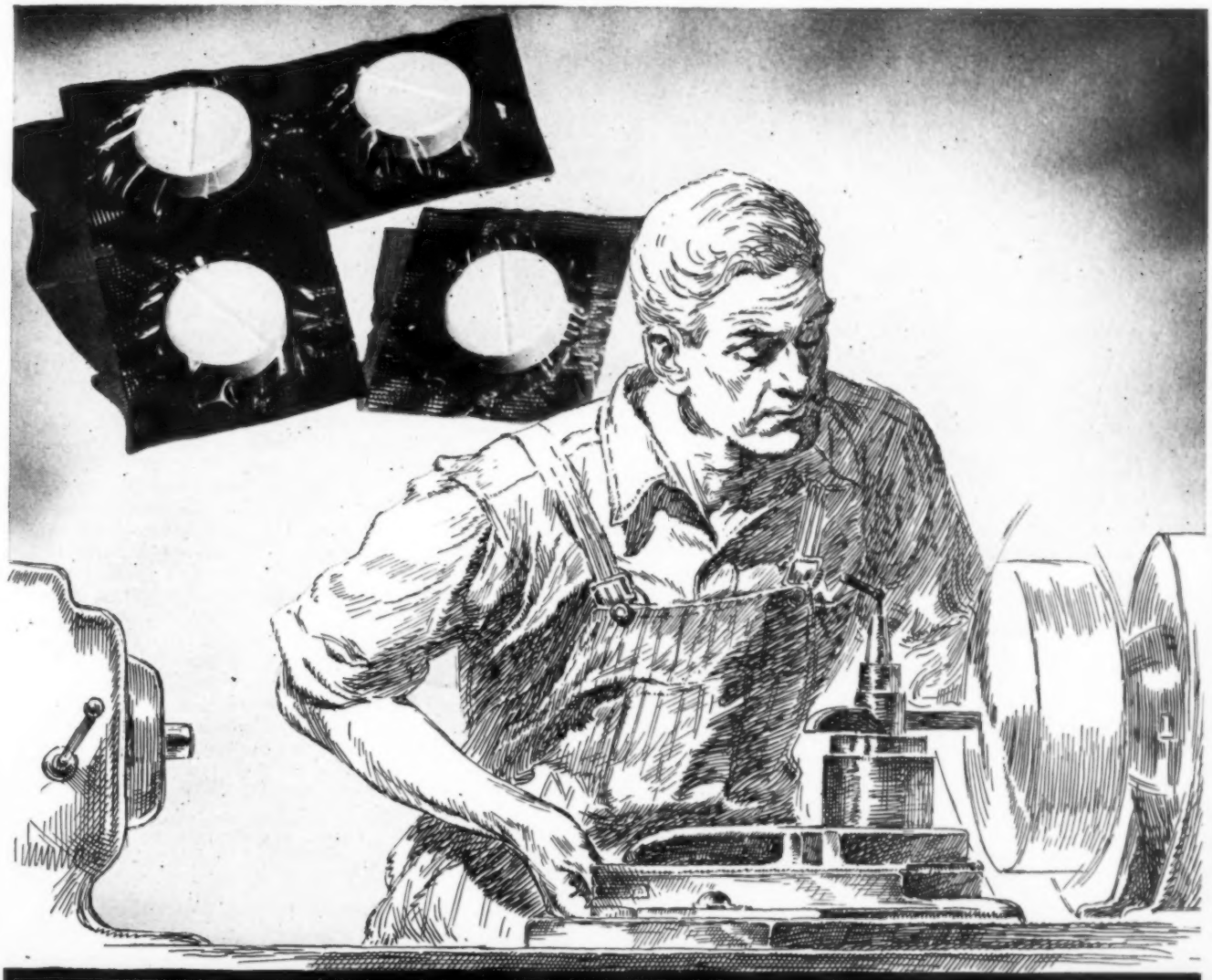

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As production pressure has increased, and the employment of women has been intensified, expanding cooperation is the more desirable that the whole plant may the more successfully achieve its goal: Management in the production of goods; labor in the satisfaction of exercising its right to make a living. May the establishment of a plant policy for the pregnant woman, as herein suggested, be a constructive contribution to this great achievement.

References

(1) Reference: Appended Procedure Outline.
(2) Standards for Maternity Care and Employability of Mothers in Industry. Prepared by the Children's Bureau and the Women's Bureau of the United States Department of Labor, July, 1942.
(3) An Industrial Health Program for a County Medical Society, *J.A.M.A.*, 121: 259 (January 23), 1943.
(4) Women In Industry, *J.A.M.A.*, Volume 121, No. 11, (March 13), 1943.

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Your Safety is no Stronger than YOU make it.

Your Industry's Services Include Safeguards for the Pregnant Woman

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2. **Reporting to your Family Doctor.**
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PREGNANT WOMAN
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NEWS, COMMENT and OPINION

—Continued from page 497.

AVERAGE consumption of pharmaceuticals of men overseas is two pounds per man per month.

—Upjohn Company, release.

IT IS evident from our present upward trend of accidents on duty that additional trained personnel in our plant safety organizations is urgently needed.

—T. LYLE HAZLETT, M.D., Medical Director, in *Westinghouse Safety News*, April, 1944.

Prevention to Be Demanded

A GOOD proportion of the industrial establishments in this country, and the labor unions, too, have learned more about industrial hygiene in the past two years than they ever knew before. Management and labor, then, are the sources from which demands for more services will come, and I am sure the demand will continue—in crescendo. I do think, however, that any substantial real expansion of industrial hygiene work in the future depends upon certain eventualities. First, if management, labor, and the government acquire a larger financial stake in workers' health and safety, obviously increased facilities will be demanded, both within the plant and in consultant and technical services. There is now before the Congress legislation which would provide health insurance for workers covered under the Social Security Act. If this or similar legislation is passed, the three contributors to the insurance plan will insist upon adequate preventive services to reduce time loss due to disability.

—From "Industrial Hygiene in the Postwar World," by JAMES G. TOWNSEND, M.D., in *J.P.H.A.*, July, 1944

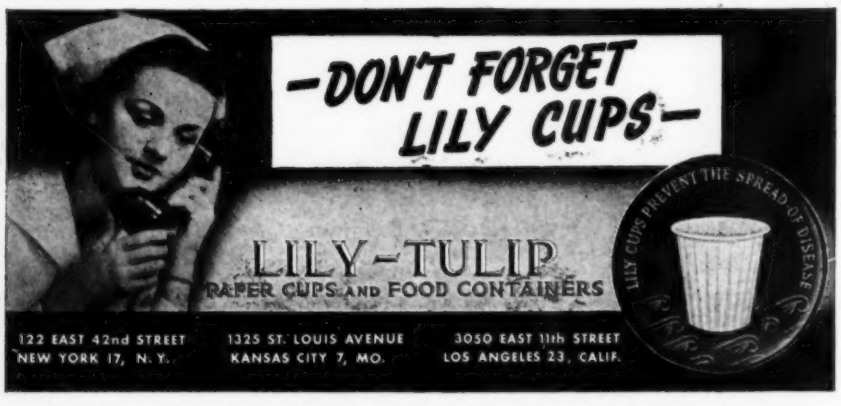
No Hazard

BY WAY of conclusion of this discussion of the radiant energy hazard of welding, two matters of interest warrant inclusion. The first concerns the alleged effect of welding in producing sterility in welders, particularly in women welders. This story became so widespread in shipyards as to require official and repeated denial. There is no evidence that infra-red, visible or ultra-violet energy, produced in welding and burning can affect the reproductive organs or functions. This story had its origin because of the assumption that ultra-violet affected workers in the same manner as x-rays or gamma-rays, both of which can produce sterility. However, there is no exposure to either of these types of rays in welding, hence the alleged hazard is non-existent. The second matter is the relation of welding to the widespread epidemic of keraconjunctivitis that spread through our factories and shipyards during the last few years. There does not appear to be any causal relationship between welding and this ailment. The disease has been shown to be of virus origin and to be spread from the infected eyes of one workman to the uninfected eyes of another by infected hands, instruments and goggles. One hypothesis as to the reason for the rapid spread of this disease during the early stages of the outbreak is the assumption that welders who suffered eye irritation from ultra-violet exposure or any other form of eye injury went to the plant dispensary for treatment and there had the virus transferred to their eyes on the infected hands and instruments of the dispensary staff, because at that time it was not realized that it was a virus disease and could be so easily transmitted in this manner. Similarly, welders and others used goggles previously worn by an infected person and not subsequently sterilized. Therefore the control of this disease among welders, as among all workmen, involves clean hands, clean instruments and clean goggles in the eye examination room and in the plant.

—From "For Effective Controls of Hazards in Welding, Flame Cutting, and Metallizing," by ARTHUR C. STERN, Division of Industrial Hygiene, New York State Department of Labor, in *The Industrial Bulletin*, April, 1944.

Industrial Skin Disorders

W. GILLIES ANNAN (*British Journal of Physical Medicine and Industrial Hygiene*, March-April, 1944) decries the looseness with which the terms "dermatitis" and "eczema" are employed by the medical profession in general. Viewing the problem from a single standpoint it is well to remember that workers engaged in industry are just as prone to develop many skin ailments which do not result from industrial work, and conditions which cause these disorders should be carefully investigated: impetigo, scabies, ringworm, pedicular infections, seborrhea and syphilis. It is necessary to consider what is signified by the terms dermatitis and eczema. Dermatitis means an inflammation of the skin and therefore the signs and symptoms are analogous to those of inflammation of any other organ: heat, redness (erythema), swelling (edema), pain (pruritus) and loss of function. Eczema is the reaction of an irritable or hypersensitive skin, which may be inherent or acquired, and in either event it may be provoked by exogenous or endogenous factors which are too mild to upset a normal skin. The characteristic early lesions are grouped small, pale pink papules, with vesicular elements, situated on non-inflammatory bases. In diagnosis, many factors require consideration and no single one is decisive, but none more so than a care-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fully recorded history. It is important to ascertain whether the dermatitis was present before the patient commenced work, during the working period or within a certain time of ceasing work and whether others were affected, because the case may be an isolated one or the dermatitis may be peculiar to the industrial process involved. A careful search should be made for common skin diseases as it is not unusual in many instances to find scabies, fungus infections of the feet and groins, impetigo, furunculosis and even syphilis classified as "occupational dermatitis." The primary lesion is erythematous and usually progresses to papular and vesicular formation with oozing and crusting as a result of mixed morphology. The initial erythema is unusually bright. The primary sites of predilection are invariably the backs of the hands and the fronts and inner aspects of the forearms (in the case of solids and liquids) and the face and neck (in the case of fine powders or vapors), but the socks and trousers may be splashed and a dermatitis set up in the corresponding areas. Likewise, pressure or friction around the waist line or around the neck and ankles may tend to make these areas primarily affected. As a result of scratching due to itching there may be infection of the already inflamed skin. The scratching may be automatic during sleep. The first real difficulty is to decide whether originally the condition was occupational or not and the second is to discover the cause of the "eczema" reaction. Which came first, the "dermatitis" or the "eczema"? To solve this problem a carefully taken history is essential. The Bloch patch test has been invaluable in determining the causative factor in many cases of contact dermatitis and has assisted in the solution of some of the problems in the group of cutaneous eruptions defined as "'eczema." As regards treatment, general and local, the following golden rules should be observed: (1) Remove the person from the process or rectify the process if many workers are affected. (2) Improve the general conditions and rectify, if possible, whatever contributory causes may be present. (3) If the individual is young a change of job is indicated. (4) Use soothing remedies, preferably of a non-antiseptic nature, as the main line of local therapy. (5) Avoid using heavy dressings such as wool, hot fomentations, which need to be used with care and infrequently and too frequent dressings, and do not indulge in undue cutting or probing.

—Review in *Urol. & Cutan. Rev.*, June, 1944.

Patch Test

THE TEST was first used as a means of determining the actual causative irritant in cases of contact dermatitis. Since dermatitis has on many occasions been found to be caused by irritant chemicals contained in wearing apparel and cosmetics, manufacturers have taken advantage of the patch test to determine the possible skin-irritating or sensitizing properties of new products before placing them on sale to the public. Some enthusiasts have even proposed the inclusion of the patch test as part of the pre-employment examination with the idea of weeding out those workers who might develop occupational dermatitis. The fallacy of this proposal lies in the fact that most workers develop occupational dermatitis by contact with a primary irritant or by acquiring an allergy while actually employed. Pre-employment patch testing, therefore, could not weed out those who would become sensitized. It is now universally accepted that the patch test, if properly performed and interpreted, is a valuable diagnostic procedure. Its value in preventing possible outbreaks of dermatitis from the use of materials containing new chemicals before they are put into general use is just becoming recognized.

—From "The Patch Test in Contact Dermatitis," by LOUIS SCHWARTZ, and SAMUEL M. PECK, in *Public Health Reports*, 59:17, 546-557 (April 28) 1944.

Education in Self Discipline

WITHIN recent times there have been an increasing number of proposals from labor unions to the Council on Industrial Health of the American Medical Association expressing a desire not only for pre-employment examinations but also some periodic health examinations and educational work in health matters. Now a new problem has arisen by reason of the fact that there will be so many men returning from the military services who must have thorough-going physical examinations and placement on a basis of their ability do to a particular job if they are to be given their old positions in industry and are given any priority in that respect. This problem also has come to the Board of Trustees, and while we were familiar with this activity in a national way it seemed to lack as yet real form, definition or any real proposal as to the mechanism to be followed. The definition of physical fitness as it has been presented to the Board is that fitness, first, will result in a minimum of disability due to sickness of any type; second, will result in ability to recover rapidly from fatigue and exhaustion. Industry is interested in that. A fitness that will insure the ability to perform any task, whether military or civilian, efficiently within the limits of the human body. Physical fitness based on an ideal which will demand a common effort on the part of the individual to maintain vigor and health, and along with that will have some stimulation to appearance and those things which should be, especially to growing youngsters, of some pride in endurance and ability to do that thing which we stimulate in athletics in the schools today. Fitness based on sound home, school and community training. This definition includes the factor which we have all come to realize has been more or less missing; that is, some education in self discipline. The Trustees, after giving thought to this whole matter, appointed a committee of five to participate with a committee of equal number from a group of the National Council on Physical Fitness. As I understand it, these two groups are to be advisers to the activity. The Council itself comprises a much larger number of many agencies in order to give it breadth of interest and means of activity, but these two groups are presumed to advise and are given assurance that their advice will be given consideration, which is of some importance in so large a group. The committee appointed by the American Medical Association is composed of General Lull, Dr. L. A. Buie, Dr. Morris Fishbein, Dr. W. B. Stroud and myself. This is a big program. It is going to take a long time after its public announcement to accomplish its purposes.

—DR. R. L. SENSENICH, discussing "National Program for Physical Fitness," by COL. LEONARD G. ROWNTREE, read before the Section on Medical Practice, A.M.A., June 15, published in *J.A.M.A.*, July 22, 1944.

The Doctor's Freedoms

SUCH freedom of choice and action on the part of the physician cannot continue under the provisions of the Wagner-Murray-Dingell bill. The bill proclaims freedoms, but they are regimented and circumscribed freedoms, foreign to the American mind in the field of medical science. If the doctor stays out of the plan and remains non-cooperative, as he is free to do, he obviously becomes aloof from his community to wrestle alone with his conscience. If he goes into the plan he becomes as free as the bird in the cage. If he sets himself up as a specialist he becomes accountable to the Surgeon General to whose satisfaction he must prove the measure of his special skill to qualify for the extra fee assigned to the particular ailment in which he specializes. Of course he will remain free to pick his own patients, but the government will tell him how many he may have on his list, and as the patients are left free to designate what doctor they want, chances are that after all the picking and choosing is done there are some people without doctors and some doctors without patients. At that point the Surgeon General steps into the picture again and allocates the unattached clients to unwilling doctors.

—From "A Revolutionary Social Security Proposal," in *Industry*, May, 1944.

Shangri-La

JUST as Spain served as a sort of military guinea pig before the onset of World War II, so New Zealand served as a pre-war guinea

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pig for socialization experiments. So vast were New Zealand's expenditures on social security that she was practically bankrupt, her credit being exhausted and foreign loans unobtainable; wealth was taxed almost out of existence; the forty-hour week had to be replaced with one of fifty-four hours; unemployment before the war was unprecedentedly great; the people of New Zealand had become the most heavily indebted in the world; there was constant governmental hostility and harassment of industry. At present, the doctors' paper work, increased ten-fold, prevents proper diagnosis and treatment; the quality of practice has deteriorated; a profusion of certificates for the various benefits is required—thus a patient may leave the office with half a dozen filled in documents, for bureaucratic red tape is unavoidable under such a system; the methods of payment closely parallel those proposed in the Wagner-Murray-Dingell bill for the United States. Some allowances for these conditions, of course, must be made because of the necessary civilian regimentation under the pressure of war. This is the Shangri-La to which politicians seek to lead us.

Not Interested

LIEUT. COL. HAROLD C. LUETH, liaison officer with A.M.A., report, in *J.A.M.A.*, June 24, 1944 (125:8, 558): Extract: "A questionnaire was prepared and mailed to certain medical officers by the Committee on Postwar Medical Service in an attempt to determine the probable needs of medical officers during the postwar period. The questionnaire consisted of five main sections. Provision was made for additional information or remarks by the medical officers. Signature of the medical officer was optional. The questionnaires were mailed to a selected group of 3,000 medical officers on duty with the armed forces. An alphabetical machine record list of of all medical officers on duty with the Army, Navy, Public Health Service and Veterans Administration as of Sept. 30, 1943, was used. Every fifteenth name was marked and a questionnaire mailed to the medical officer. A return self-addressed envelop was enclosed with the questionnaire to facilitate early reply and return. An arbitrary selection from an alphabetical list was considered to be a fair method of random sampling and was believed to yield an excellent indication of the entire group. In that manner, it was felt, there would be an even distribution of questionnaires among the Army, Navy, Public Health Service and Veterans Administration. Also the questionnaires would be proportionately distributed among the age groups as well as between those in various foreign and home assignments. The mailings were begun in February, 1944, and continued until the end of March. There were 927 questionnaires, or 31%, returned by the first of June, which represents an excellent return when the wide dispersal of the armed forces and the constant movement of troops are considered. Early returns were largely from medical officers in the continental United States. The report may be considered in two groups. The first group consisted of the first 500 questionnaires received prior to April 20, mainly from medical officers in or near the United States. The second group consisted of 427 questionnaires received from April 21 to June 1, mainly from medical officers stationed at more distant posts. . . . There was less interest in industrial medicine than was anticipated. In group 1, 226 men out of 400, or 56%, stated they did not wish a position in industrial medical practice, but 137 were interested in that field of practice, of whom 11 desired a full time position and 126 a part time position. Men interested in industrial work were divided as follows: Ninety-six desired work in industrial surgery; 36 desired insurance work; 28 desired work in plant medical departments; 15 desired work in occupational disease control, and 10 desired work in other fields. There were 154, or 38%, who preferred training in industry. courses and only 19, or less than 5%, Group 2 showed a response similar to that of group 1 with regard to industrial medicine. About one-third, or 108 men out of 323, expressed interest in industrial practice, of whom only 19 wanted full time positions and 89 part time appointments. Various phases of industrial practice were selected by the following number of men: 68 in industrial surgery, 37 in insurance, 26 in plant medical department work, eight in occupational disease work and 11 in other fields. University training was selected by 102 men, whereas only 16 preferred training in industry. Medical officers in group three showed a greater interest in full time positions than the preceding groups. There were 45, or 27%, interested in industrial medicine, of whom 17 desired full time positions and 28 wanted part time appointments. Interests varied as follows: Twenty-six wanted industrial surgery; 18 wanted insurance positions; 15 wanted plant medical department work; six wanted occupational disease control, and 10 wanted other fields of practice. There were 59, or 35%, who said that they would attend university training courses and nine, or 5%, who would prefer training in industry. The last group consisted of the oldest officers, and they showed little interest in industrial medical practice.

LETTERS to the EDITOR

TO THE EDITOR:

I WOULD like to relate some of my experiences in the last six weeks treating dysmenorrhea. As you know, during a period like this the time element is paramount to get our work done and not hold up production. Anything that will help gain this end is worth while.

I have treated 24 cases of dysmenorrhea during this period with 1-100 gr. nitroglycerin dissolved under the tongue. The results were so striking in five cases that all pain was relieved within one minute, and they were able to return to their work. Ordinarily the condition would have caused them to stop work at least a day. Previously, they had very little relief from codeine, aspirin and other medicines that are so commonly used for this purpose. On five cases I had fair results, and on the rest of the cases I had poor results.

While this is not a cure-all, and it does not work in all cases, you will be surprised at the results you get in the ones that it does work on. It seems that my results were the best on the most severe cases. I hope that this will be of some benefit to others who would care to give it a trial.

—EARL R. LOWE, M.D.,
South St. Paul, Minnesota.

TO THE EDITOR

THE scientific exhibits, which are increasing in number from year to year at the Conferences of the industrial physicians and surgeons, industrial hygienists and industrial nurses engaged in the professional work of industrial health, are becoming one of the most important features of the yearly meetings. Their educational interest and value are such that we are desirous of having more of them at our next Conference, in 1945.

It is our belief that there are many individuals and groups who are doing work in industrial medicine and related subjects which is worthy of being displayed. Indeed, we know of some who are in just that position as to interesting and original developments and who have been thinking of having their material prepared for exhibit purposes, but haven't yet got around to it. Lest their arrangements be further postponed, until it will become too late for the development of proper presentation, we now request that everyone who is thinking of a scientific exhibit at the 1945 Conference of the industrial medical, hygiene, and nursing groups get busy at once. There will be scientific awards and honorable mentions for medical, and nursing exhibits.

The Committee will be glad to offer advice and suggestions regarding the physical details of assembly and mounting of the material.

Address the undersigned

—H. GLENN GARDINER, M.D.
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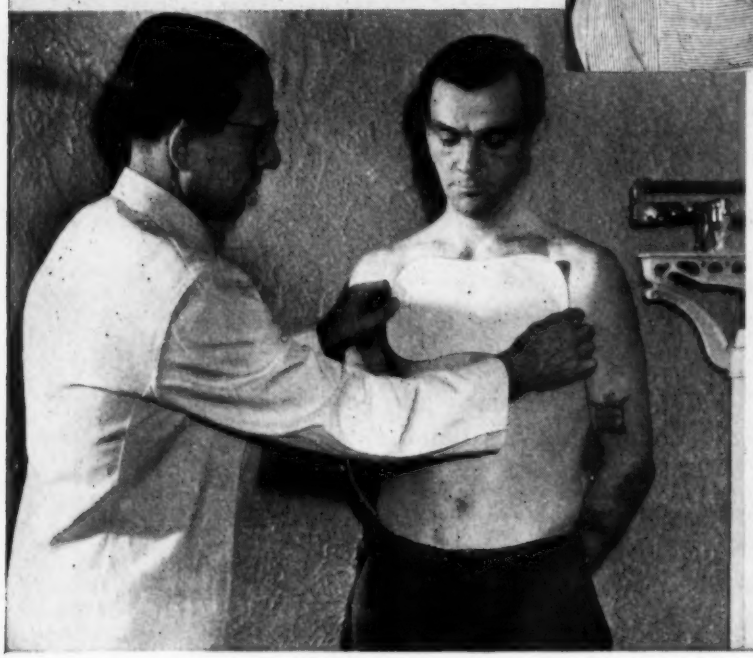

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